

PURCHASING

MARCH, 1951

DETROIT

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**130% GREATER
PRODUCTION
between tool
grinds...**

...when machining was done with **TEXACO CLEARTEX CUTTING OIL**

In this plant,* steel parts for pumps were being machined on Acme Gridley automatics. Two different competitive oils were being used — one as cutting fluid and the other as machine lubricant. Production lagged because of frequent tool changes, and contamination of coolant by machine oil necessitated frequent oil changes.

Then a Texaco Lubrication Engineer was asked what could be done to speed up production. He recommended using *Texaco Cleartex Cutting Oil B* as both coolant and machine lubricant. One oil thus replaced two; contamination problems and oil wastage were eliminated — and *production between tool grinds immediately jumped 130%!*

Machining stainless steel on the same set-up, use of *Texaco Cleartex Cutting Oil B* increased production between tool grinds 42%.

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Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

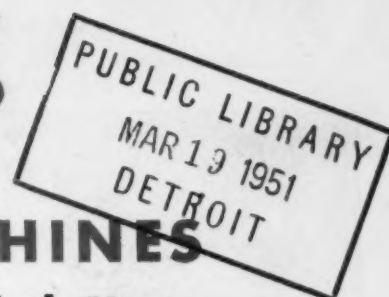
*Name of this Texaco user on request

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4. High starting torque with low starting current — for such ap-

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RESEARCH KEEPS

B.F. Goodrich

FIRST IN RUBBER



Photo courtesy Meyer Furnace Co.

Hose lasts for years in heat, oil, hard knocks

B. F. Goodrich Type 50 air hose for general service

THIS man is operating a small air tamper to pack sand in what foundrymen call a "flask". The air is hot, the floors are rough and grimy.

The air hose on such jobs used to have to be replaced every few months. It was sometimes crushed by falling materials. Or the hot air would harden the rubber, causing it to crack. Or oil would cause rotting in the hose tube when oil was used to lubricate tools.

B. F. Goodrich engineers studied the problem and developed new rubber compounds for both tube and cover. The hose is called B. F. Goodrich Type 50 air hose, shown above in its fifth year of service at this foundry.

Oil won't rot it—This Type 50 air hose has an oil-resisting tube that won't break into loose, gummy particles, clogging up tools. The cover is oil-resisting too. Workers with oily hands or gloves can handle it, use it near oily machines and surfaces.

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Goodrich Type 50 air hose is recommended for shop tools, tie tamping, light and heavy portable compressors, air hoists, ore mining and quarry service.

Your local BFG distributor has all the details and prices on these and other B. F. Goodrich air hose, many with features found only in hose made by B. F. Goodrich. Give him a call, or write *The B. F. Goodrich Company, Industrial and General Products Division, Akron, Ohio.*

Air Hose
BY
B.F. Goodrich

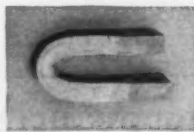
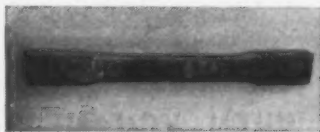
INLAND DATA for STEEL USERS INLAND STEEL CO.

38 S. Dearborn Street, Chicago 3, Illinois

*Typical mill tests
for quality control
of your steels*

An important aspect of steel manufacturing is that, in the great majority of cases, steel is "tailor-made" to meet a specification or to make a particular part. It is therefore necessary for the steelmaker to know as much about each heat of steel as can be efficiently obtained. The tests described below are the main tests run by the steel producer to check the quality of the steel

against the specified requirements. Naturally these tests do not stand alone as the final quality determinants. The steelmaker uses many other tests and his metallurgical experience as well as his knowledge of the steel fabricating processes to assure the customer of the right steel for the job.



BEND TEST

Bend tests are employed to determine the ability of steel to withstand cracking during subsequent forming operations at the customer's plant. Basically, the test consists of bending test pieces through certain specified arcs. (photos 1 and 2). The amount of bending a piece of steel will withstand depends on its chemical composition, its tensile strength, its thickness, and its grain structure.



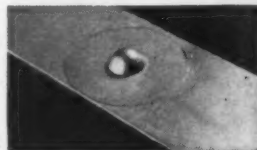
HARDNESS TEST

Abrasion, indentation, wear, cutting and shearing . . . all these are related to the hardness factor of the steel. Hardness tests are most often made after the steel has been heat-treated or just before it is to be temper rolled. Hardness is measured by Rockwell or Brinell testing machines (photo 3) which indent the surface of the specimen with a predetermined load. The

relationship of the load and depth of indentation is then translated into a hardness reading.

CUPPING TEST

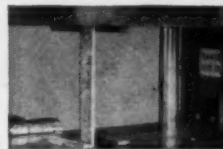
Clues to a steel's suitability for future drawing operations are uncovered by the cupping test. In this test, a sample piece of steel is placed in a special machine in which a smooth metal ball is forced against the flat surface of the specimen thus drawing it into the form of a cup and continuing the



distortion until the material is fractured (photos 4 and 5).

TENSION TEST

In applications where the steel will be under stress, either static or dynamic, the steel mill quality control department is interested in determining certain mechanical properties of the steel . . . tensile strength, yield point and the amount of elongation in a specimen of a certain length. Specimens of the various products are pulled asunder until fractured by hydraulic or mechanical testing machines which accurately measure the applied load (photos 6 and 7).



CHEMICAL DETERMINATION

The most widely used tests for quality control of steel at the mill, are the tests which determine chemical compositions of the raw materials and the finished products. It is estimated that Inland runs 1,250,000 chemical determinations each year. In addition to the wet chemical tests, the spectrographic method (photo 8) is widely employed for making quick, accurate determinations.





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The National Magazine of Industrial Procurement

VOL. 30, No. 3

MARCH, 1951

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What's good grooming for a golf shaft?

...*A brush!*

Prior to plating, golf shafts must be perfectly clean, free of heat-treat discoloration and surface imperfections. In cleaning and finishing, the problem was to get into the corners of the tapered True Temper "step-down" and to do the job in one pass at high speed.

The problem was solved with a five-station, in-line automatic machine equipped with Osborn Fascut® Brushes. This automatic brushing gives the shafts a smooth, uniform finish over the entire surface... and it has increased output 20% over the former method.

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MARCH, 1951

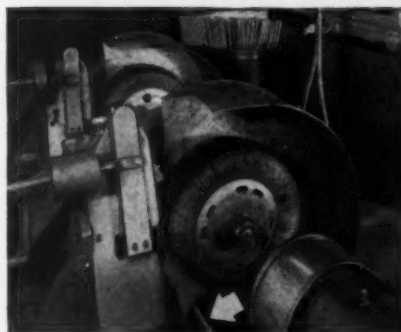
Want Additional Product Information? See Page 19.

Osborn Brushes step up finishing output **20%**

The problem here was to remove heat-treat discoloration and surface imperfections from golf shafts prior to plating. Due to the tapered True Temper "step-down" design of the shaft, it was difficult to get into the "step-down" corners with the former method. Two or three passes were required for thorough cleaning.



Now, with the five-station machine shown above, Osborn Fascut® Brushes, with compound, finish the shafts in one pass, netting a 20% increase in output. Uniform quality of finish over the entire surface is duplicated accurately from piece to piece due to the ability of the Fascut Brushes to blend with the exact contour of the golf shaft.



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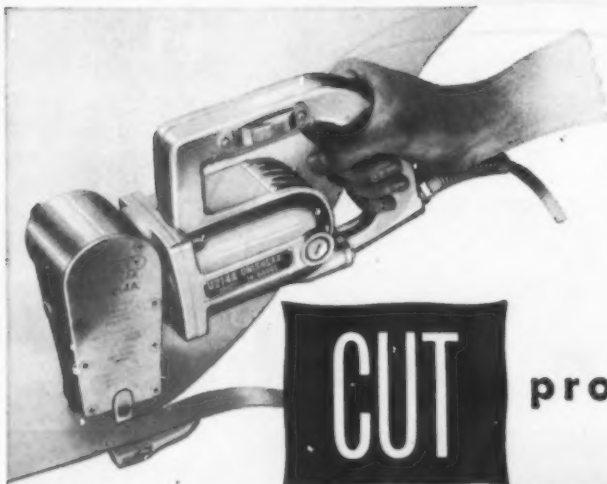
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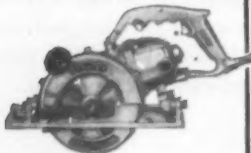
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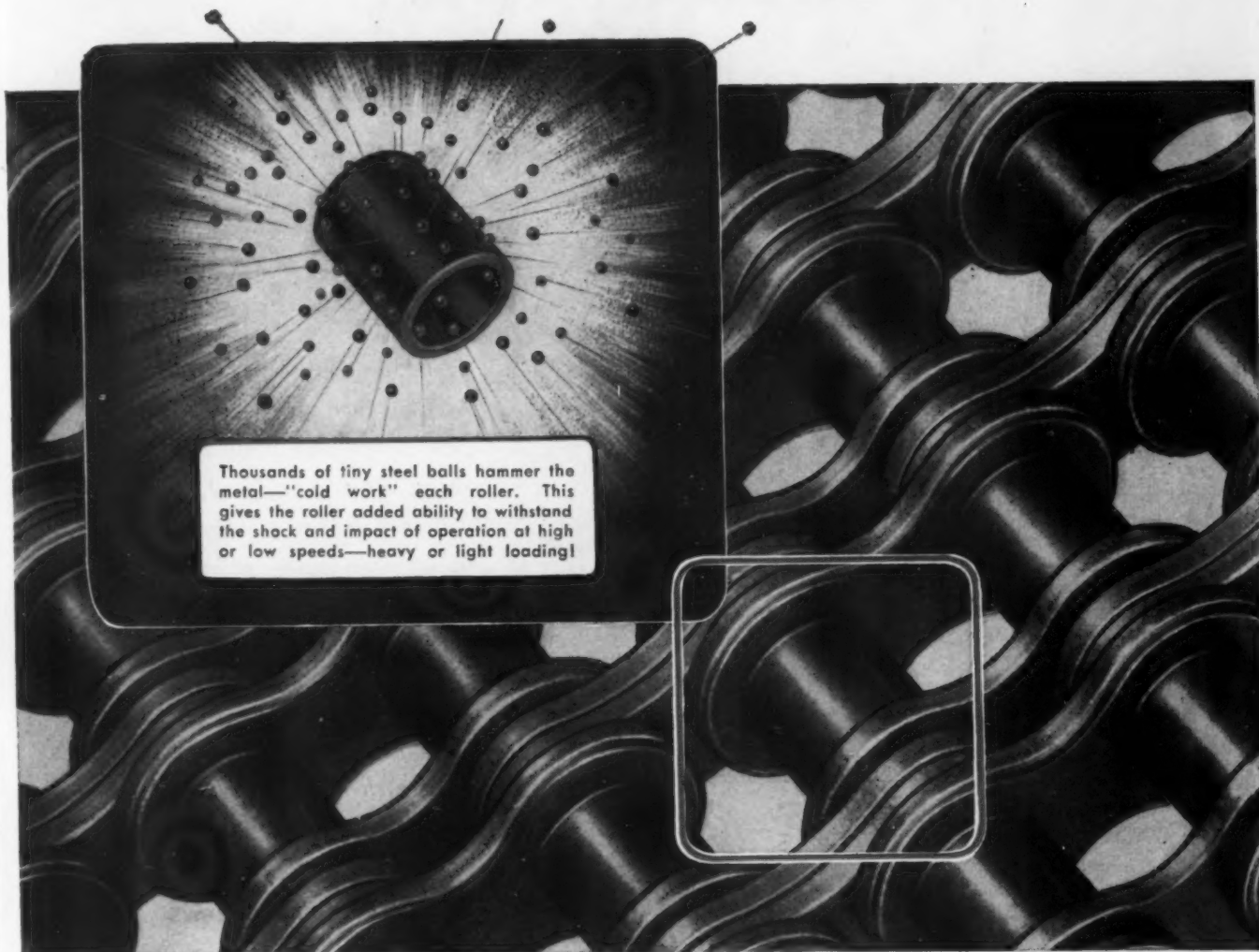
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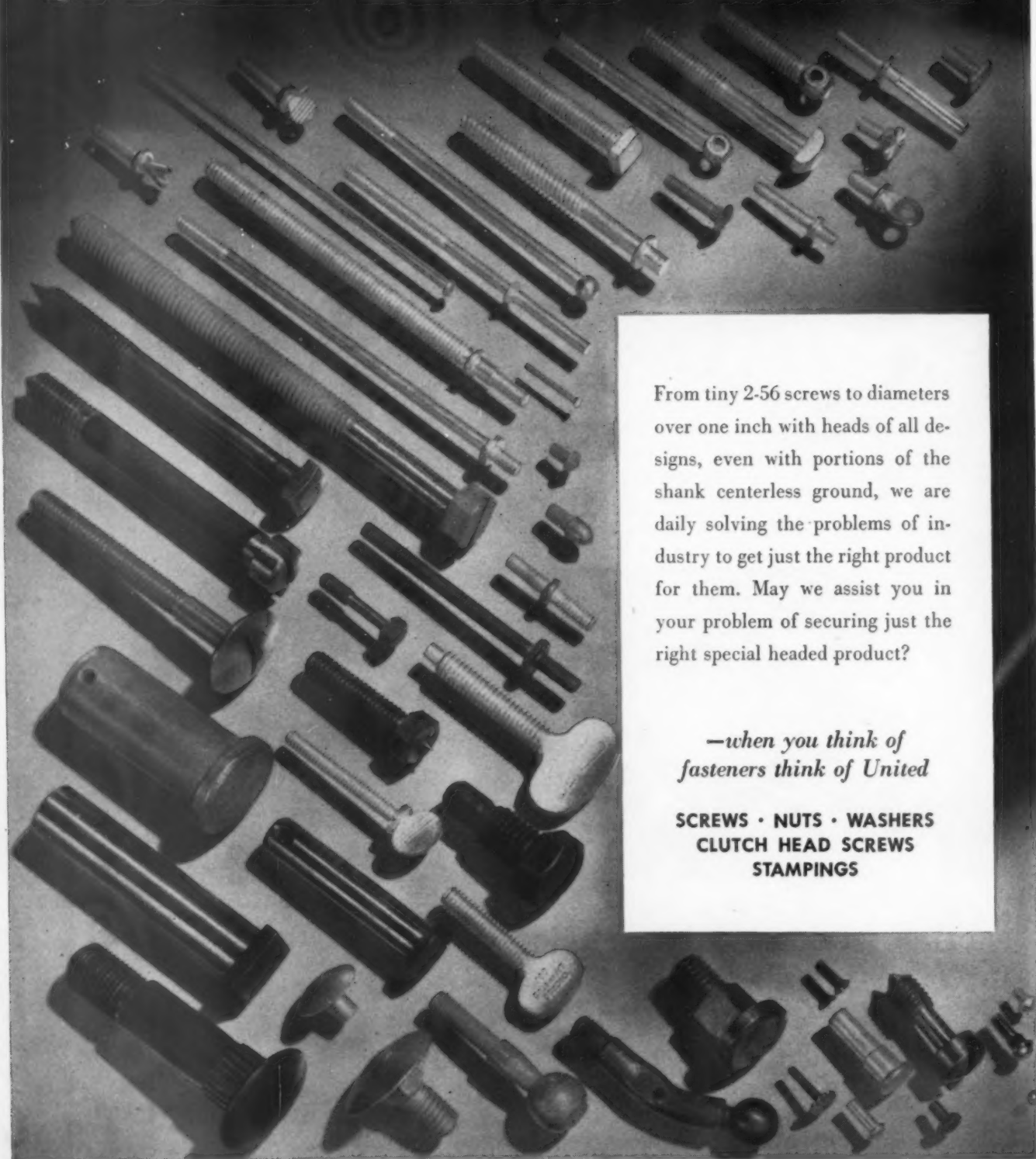
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PURCHASING PREVIEWS

A WASHINGTON REPORT FOR PURCHASING AGENTS

March 1, 1951.

DEFENSE PRODUCTION IS LAGGING BEHIND CONTROLS

Restrictions on civilian use of materials are moving ahead more quickly than military procurements, with a resultant slack in the economy. Effort is being made to goad the military into placing more contracts faster, but the basic problem revolves around the fact that the bulk of military procurements is for items requiring long lead time.

This means that even though the prime contracts are placed, it takes a considerable time for the various tiers of subcontracting and supply to find their way into such production capacity as is opened by cuts in civilian production.

National Production Authority position is that it is clearing the track to open up production capacity and make materials available through a combination of materials set-asides at the mills, and limitation and conservation orders which reduce drastically the civilian take of non-ferrous metals and high alloy steels.

PROCUREMENTS NOW LARGELY ON NEGOTIATED BASIS

Military procurement has stepped up sharply since State of National Emergency was declared. Previous to this declaration, the services were required to place the major portion of purchases on an advertised bid basis.

Policy is now reversed. The military is buying on an advertised bid basis only when it is clear that such method of purchase will not interfere with delivery as required. This means that purchases of other than standard stock items are being largely negotiated.

Military purchase officials estimate that negotiated purchase cuts procurement time on major items of supply from an average of 90 to 180 days on an advertised bid basis to roughly 45 days when the purchase is negotiated.

CONTRACTS TO BE SPREAD WIDELY AMONG SUPPLIERS

Policy of Secretary of Defense to broaden the base of military production means that Army, Navy and Air Force will seek to attract more suppliers. Initial Air Force action to increase suppliers was the spreading of aviation contracts over into the automotive industry.

In general terms, the services will restrict their supply sources to manufacturers or regular dealers in the required items, who can demonstrate their ability to perform on the contract.

A policy has been adopted to favor "smaller" manufacturers when possible. A "smaller" manufacturer is one which employs less than 500 persons in the aggregate, including its affiliates. An effort will be made to place as many negotiated contracts as possible with concerns in this size range.

Where it is not feasible to let contracts to the smaller contractors, the larger primes who indicate that they will place subcontracts with smaller firms will be favored.

Military procurement officers have been instructed to place contracts with associations of small business firms (such as the companies working under the Minnesota Plan), but such organizations must be organized as legal entities, with financial responsibility, and must be qualified to bid or contract for Government business.

SUBCONTRACTORS TO PROVIDE BULK OF SUPPLIES

Bulk of military suppliers will be working on components, parts and supplies—subcontracts.

This means that the largest part of military purchases will be made by industrial purchasing agents.

Many of the major military contracts are more in the nature of management contracts than production contracts. In production of airplanes, the airframe builders

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▲ PURCHASING PREVIEWS

continued

receive a contract to supply the airframe, plus the requirement that they install the various pieces of Government furnished equipment to complete the airplane.

The extent to which the various tiers of subcontracting and supply enter into munitions production is best illustrated by a study made of World War II procurement of a heavy tank—showing that more than 3,000 subcontractors and suppliers participated in the final delivery of the tank.

DATE FOR STARTING CMP IS IN DOUBT

While the decision remains firm to inaugurate a Controlled Materials Plan modeled closely after the CMP of World War II, there is considerable doubt about the timing of the allocations program.

Major question is how quickly military procurement moves in to take over industrial facilities, and how much material will be needed in military production.

The restrictions against use of copper in many essential items of housing construction will cut back home building more drastically than the previously instituted restrictions on finance. The restrictions on the use of tin and brass will, in many instances, shut off a number of industries which might be classed as non-essential, but which nonetheless provide a considerable volume of employment.

The cutbacks serve, in effect, to bring supply and demand into better balance for many materials, and it is only when military demands increase to a point where materials are no longer available in sufficient quantity for essential civilian requirements, that it will become necessary to allocate materials to the military and essential civilian.

On this account, timing of CMP will depend on how quickly military orders take up the materials slack created by cutbacks in civilian usage. The earliest that an allocations plan can become fully operative is the third quarter of this year.

INDUSTRIAL EXPANSION CONSUMING LARGE STORES OF MATERIALS

A complicating factor in determining the availability of materials for civilian use is the wide variety of expansion programs superimposed on the large increase in munitions production.

Expansion of steel production takes a substantial tonnage of steel and materials which might otherwise be used for direct military production. Similarly the large expansion of freight car building and production of a large number of locomotives entails huge tonnages of materials.

Basis for the expansion is the programming of a major buildup of our actual military strength and of the industrial potential. Thinking is that the buildup should continue for 18 months, and thereafter taper off.

PRICE AND WAGE CONTROLS SO FAR ARE MERELY "HOLDING" ACTIONS

Efforts at stabilization of wages and prices have been based largely on slowing down the inflationary trend until Congress provides some mechanism to control farm and food prices.

It is now generally accepted that there can be no effective tight control over wages unless there is a corresponding tight control over prices, and with food prices a major item in the cost of living, effort will be made to get additional Congressional authority to hold the price line on agricultural commodities and food.

Over-riding fact on economic stabilization is that with the so-called tight controls exercised during the war years by OPA, there still was a very substantial increase in the level of prices, and this points up the problems of the loosely drawn and hastily conceived efforts at economic controls which have been instituted to date.

INDUSTRIAL SUBSIDIES NOT IN PROSPECT

The possible use of subsidies to hold down food prices at the consumer level opens up the question of the other two wartime uses of subsidy payments.

Use of premiums to stimulate production of high cost scarce ores, which brought in a considerable tonnage of metals is not an immediate prospect. Nor has there been any suggestion that the World War II expedient be revived of giving smaller suppliers a 15% preference in their bidding on military contracts.

Facts are that the economy is still a considerable distance from full mobilization, and there still is no clear indication of how far along the road to all-out war the recurrent tensions and conflicts with the Soviets will take us.

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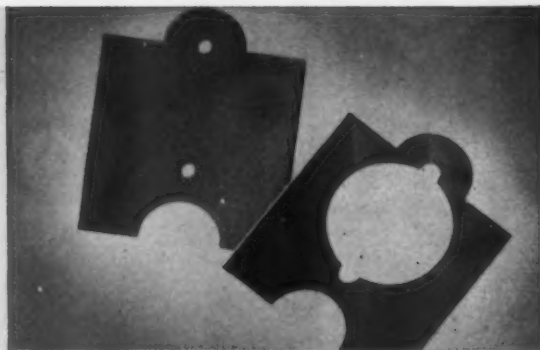
on Taylor Laminated Plastics and their application is available. If you have a purchasing problem as indicated above, write today for the new 1951 Taylor Laminated Plastics Catalog. If possible, state your problem. Your copy will be sent you promptly and, experienced Taylor Sales Engineers will be happy to consult with you without obligation.



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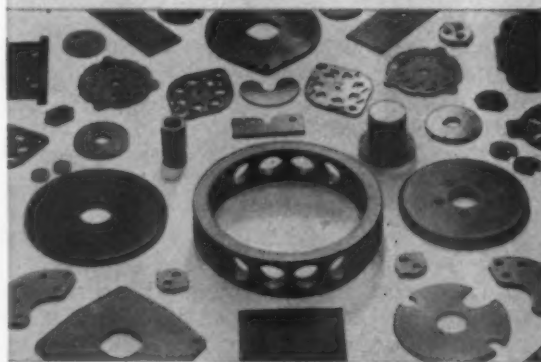
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WEST COAST FACTORY: LA VERNE, CALIF.



This two-part radio insulator is typical of Taylor's ability to mass-produce accurate parts. Each is stamped in a single operation, one from Taylor Vulcanized Fibre and the other from Grade XXXP-10 Taylor Phenol Fibre, noted for its high dielectric strength. Whatever combination of qualities you may need, it's a good bet that one of the many Taylor grades can fulfill your requirements.



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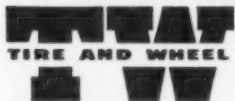
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—When Writing to Manufacturers Direct, Please Mention **PURCHASING Magazine.**—

☐ **1. DIE CASTINGS**—Bulletin describes the Certified Zinc Alloy Plan, and use of quality certification seal. American Die Casting Institute, Inc., 366 Madison Ave., New York, N. Y.

☐ **2. WELDING**—New Hand Torch Catalog No. 2, 36 pages, shows the right torch for light, medium or heavy welding, cutting, heating, brazing, descaling and flame hardening. It includes 14½ pages of detailed easy-to-read charts that show how to select the right torch, tip, mixer and extension for any job. Air Reduction Sales Co., 60 E. 42nd St., New York 17, N. Y.

☐ **3. RUBBER PARTS**—Rubber Handbook covers molded rubber parts and products and their precision production and unusual qualities. Copy available on letterhead request. Acushnet Process Co., New Bedford, Mass.

☐ **4. ACCO Products**—Compact booklet DH-509 gives detailed list of products made by divisions of American Chain & Cable Co., Inc.—chain, wire rope, cutting machines, hoists, cranes, pressure gauges, automotive equipment, chain link fence, valves, castings, bolts and nuts, hardness testers, etc. American Chain & Cable Co., Inc., Bridgeport, Conn.

☐ **5. GRINDING, POLISHING**—“Facts about Backstand Belt Grinding and Polishing” is title of booklet that tells how to save time and

cut costs. Armour Coated Abrasives Divn., North Benton Road, Alliance, Ohio.

☐ **6. V-BELT DRIVES**—120 page Texrope Pre-Engineered Drive Manual 6956 which tells about the Magic-Grip Sheave, V-belts, Speed changers, variable speed sheaves, has been issued by Allis-Chalmers, Milwaukee 1, Wis.

☐ **7. MICROMETERS**—Folder describes complete new line of Micrometers. Brown & Sharpe Mfg. Co., Providence 1, R. I.

☐ **8. STAINLESS TUBING**—Stainless Tubing Slide Chart contains useful data on analyses, physical

properties, economical bending radii, standard sizes, etc. Copy available on letterhead request. The Carpenter Steel Co., Alloy Co., Alloy Tube Divn., Union, N. J.

☐ **9. STEEL CASTINGS**—Brochure cites 12 factors to consider when buying steel castings. Continental Foundry & Machine Co., East Chicago, Indiana.

☐ **10. RUBBER PARTS**—Molded and extruded rubber parts are the subject of Catalog which lists hundreds of standard grommets, bushings, rings and extruded rubber shapes. Continental Rubber Works, 1983 Liberty Blvd., Erie 6, Pa.

☐ **11. CASTERS**—68-page catalog details Colson Casters. The Colson Corp., Elyria, Ohio.

☐ **12. FRACTIONAL HP MOTORS**—Bulletin GES-3565 details GE small motors. Apparatus Department, General Electric Co., Schenectady, N. Y.

☐ **13. V-BELT DRIVES**—“Guide for Selecting or designing V-Belt Drives” is available from The Gates Rubber Co., 965 So. Broadway, Denver, Colo.

☐ **14. TUBING**—General catalog covers steel tubes available in carbon steels, alloy steels, stainless steels, high purity iron, steels for high temperature service, standard and special analyses, standard (Please turn to page 21)

READER SERVICE

All listings include names and addresses of manufacturers.

However, each one is numbered. If you want to save multiple-letter writing, just jot down the numbers of the items you want and month of issue, and list them in a letter on your COMPANY letterhead to

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New Products Section
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**SQUARE D's
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TYPES A*, C and D
30, 60, 100 and 200 Amp. Sizes

40 YEARS DESIGN LEADERSHIP

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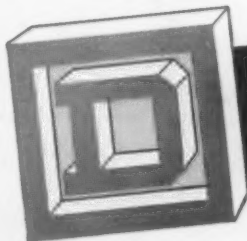
Type A switches have full interlock, visible blades and magnetic arc plate as well as a simple, quick-make-and-break mechanism, dead front line terminals, positive

pressure fuse clips, multi-spring jaws, silver-plated current carrying parts and removable pressure connectors.

**Types C and D resemble Type A in appearance but differ in construction details*

Write for Bulletin 3100 for further details. Square D Company, 6060 Rivard Street, Detroit 11, Michigan

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(Continued from page 19)

dard and special shapes and forms, etc. Globe Steel Tubes Co., Milwaukee 4, Wis.

☐ **15. FIRE PROTECTION**—Ask for File 660; gives information about dry chemical piped systems for automatic protection and is accompanied by Periodic Inspection Record Chart. Ansul Chemical Co., Marinette, Wis.

☐ **16. STOP NUTS**—Elastic stop nuts, one piece construction with shock resistance and moisture-seal features are detailed in booklet available from the Elastic Stop Nut Corp., 2330 Vauxhall Road, Union, N. J.

☐ **17. MOTOR BEARINGS**—Johnson bronze electric bearings—over 300 different bearings for specific motors, are described in new catalog. Johnson Bronze, 450 South Mill St., New Castle, Pa.

☐ **18. SWITCHBOARDS**—New type switchboard for complete low voltage (600 V and under) switching requirements saves money on installation time and maintenance costs. Bulletin TEB-3 details the equipment. The Trumbull Electric Mfg. Co., Plainville, Conn.

☐ **19. LIGHTING**—Printed matter tells about fluorescent lamps with a rated average life of 7500 hours, providing lighting economy at no extra cost. Lamp Division, Westinghouse Electric Corp., Bloomfield, N. J.

☐ **20. WORK GLOVES**—Literature describes money-saving cleaning and repair service on work gloves. Gloves are reclaimed 3 to 5 times. Wash-Rite Co., Inc., 1412 Cornell Avenue, Indianapolis, Ind.

☐ **21 RUBBER PARTS**—New catalog on rubber parts, 51 SR 1 will familiarize you with rubber compounds featuring resistance to abrasion, chemicals, high and low temperatures, petroleum products and weathering. 16 pages, illustrated. More than 60 compounds are listed and charted. The Stalwart Rubber Co., 2162 Northfield Road, Bedford, Ohio.

☐ **22. ELECTRIC MOTORS**—Successful new development in air cooled motors—totally enclosed,

LATEST TRADE LITERATURE

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continuous duty, squirrel cage induction, for cool running in high temperature continuous service (enclosed ball bearings) and semi-enclosed, drip and splash proof motors (½ to 75 hp) for economical service in high temperatures, are subject of literature. Valley Electric Corp., 4221 Forest Park Blvd., St. Louis, Mo.

☐ **23. FASTENERS**—Write for copy of new Mac-it catalog covering hollow set screws, plugs, bolts, lock screws, cap screws and many other products in the Mac-it line. Strong, Carlisle & Hammond Co., Cleveland 13, Ohio.

☐ **24. STRAPPING TOOLS**—Cutting costs and doing a better job on a production basis with the Ace strapping tool is explained in folder. The Stanley Works, Steel Strapping Divn., 144 Lake St., New Britain, Conn.

☐ **25. GAGE BLOCKS**—Solid carbide Hoke precision gage blocks featured by guaranteed tolerances of plus 4, -2 millionth of an inch per inch of length, are described in circular. Pratt & Whitney, West Hartford 1, Conn.

☐ **26. DRINKING WATER**—Fountains and coolers for office and shop are described in literature. The Halsey W. Taylor Co., Warren, Ohio.

☐ **27. INDUSTRIAL TISSUES**—Literature describes Kimwipes industrial tissues for wiping and polishing. Highly absorbent, they remove dust, dirt, grease and oil quickly and safely. Kimberly-Clark Corp., Neenah, Wis.

☐ **28. INFRA RED**—Quicker baking, close control, and space savings through use of GE infrared lamps are reported. Two booklets "Bake-Dry-Heat With GE Infrared Lamps" and "Industrial Infrared Lamps" are available for the asking. General Electric Co., Div. 166-P-2, Nela Park, Cleveland 12 Ohio.

☐ **29. MECHANICAL SEALS**—Leakless operation on rotary shafts. Mechanical Seal Booklet details mechanical seals therefor. The Garlock Packing Co., Palmyra, N. Y.

☐ **30. SPRINGS**—Every type of spring in all sizes, shapes and designs to meet specialized needs. Booklet S-500 entitled "Springs and Formed Wires" will be sent to you by Wickwire Spencer Steel Division, 2 Bond St., Worcester, Mass.

☐ **31. STAINLESS STEEL**—Fewer rejects, better finishes, increased production. Company letterhead request will bring you booklet "Notebook on Machining Stainless Steels". The Carpenter Steel Co., 182 W. Bern St., Reading, Pa.

☐ **32. GROUND FLAT STOCK**—Descriptive folder covers accurately pre-ground stock in choice of oil or water hardening steel—16 thicknesses from 1/64 to 1". Single type in 8 thicknesses up to 3/16" serves for hardening in either oil or water. Complete range of 145 stock sizes. Brown & Sharpe Mfg. Co., Providence 1, R. I.

☐ **33. ENCLOSED MOTOR**—TEFC motor that cannot clog, with factory lubricated bearings, is detailed in Safety-Circle motors bulletin 51B6210. Allis-Chalmers, Milwaukee 1, Wis.

☐ **34. IRON VALVES**—Iron-body bronze mounted valve with machined body guide ribs, bronze bearings and other features is detailed in Circular 564. The Lunkenheim Co., Box 360M, Cincinnati 14, Ohio.

☐ **35. PLYWOOD-LUMBER**—For a modern approach to plywood and lumber buying, company letterhead request will bring you 20-page, full-color booklet "A New Dimension", published by Georgia-Pacific Plywood & Lumber Co., 608 No. Capitol Way, Olympia, Wash.

(Please turn to page 22)

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□ **36. SOCKETS**—Impact sockets, universal sockets, extensions, adapters. Catalog 19 lists styles, dimensions, types and size of drives, drawings and prices. Copy available on letterhead request. The Apex Machine & Tool Co., 1034 S. Patterson Blvd., Dayton 2, Ohio.

□ **37. METAL CLEANING**—Folder F7642 tells about the CrysCoat Process for pre-paint cleaning and conditioning of metals. Usually costs less than 20¢ per 1000 sq. ft. of metal. Oakite Products, 54 Thames St., New York, N. Y.

□ **38. MOUNTED WHEELS, POINTS**—Whether you buy them by the dozen or by the thousand, for fine finishing or for stock removal, you should have copy of Form 43 issued by the Norton Company, Worcester, Mass.

□ **39. JACKS**—Complete line of jacks for industrial lifting and lowering jobs are detailed in Catalog 203K. The Duff-Norton Mfg. Co., Pittsburgh 30, Pa.

□ **40. BELTING**—Uni-Pull Drive Manual details this new drive which consists of a flat leather belt, two flat pulleys and a tension-controlling motor base. Its function is to transmit power from motor to machine, and it is said to be especially suited for drives where centers are close together. It provides uniform pulling power both around and across the pulleys. Tables enable selection of proper size. Three types of motor bases. Graton & Knight Co., Worcester 4, Mass.

□ **41. JAW CRUSHERS**—Bulletin 062 describes line of jaw crushers from 2 x 6 for the laboratory, to 12 x 26 for coarse crushing. Eight types are illustrated. Sturtevant Mill Co., Harrison Sq., Boston 22, Mass.

□ **42. BENDING MANUAL**—New manual should be valuable to anyone interested in the bending of metals. It contains a wealth of bending information, and its title is "It's Easy to Bend." Copy will be sent to you by O'Neil-Irwin Mfg. Co., Lake City, Minn.

□ **43. WIRE ROPE**—Bulletin 50-25 details Monarch white strand wire rope for varied equipment uses;

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illustrations show construction and bulletin includes a chart showing breaking strength. Macwhyte Company, Kenosha, Wis.

□ **44. METAL GOODS**—Catalog 90 tells about wide assortment of metal parts—eyelets, grommets and washers, clamps, tips, fasteners, posts and screws, ferrules, arrows and hands, hangers, hole plugs, parts for radio and electrical work, rivets and stampings, etc. It illustrates over a thousand articles. It also includes equipment for riveting, punching, setting eyelets, etc. Edwin B. Stimpson Co., Brooklyn 5, N. Y.

□ **45. GASKETS**—New 48-page General Catalog details complete line of gaskets; second section is given over to detailed information on Teflon, its properties and uses and gasketing material made therefrom. It is amply illustrated with photos and line drawings, and contains up-to-date text and chart material. United States Gasket Co., 602 No. 10th St., Camden, N. J.

□ **46. ELECTRODES**—Ampco Bronze Electrode Bulletin W-17 is 24-page reference and instruction book entitled "Welding With Ampco Bronze Electrodes". Charts cover selection, preheating and weldability. Ampco Metal Inc., 1745 So. 38th St., Milwaukee 46, Wis.

□ **47. PIPE HANGERS**—Hanger catalog 10D details adjustable pipe hangers and supports for every piping requirement. Grinnell Co., Inc., Providence, R. I.

□ **48. AIR POWER**—"Controlled Air Power Devices" is title of bulletin CL 30. It tells about the Bellows Air motor and precision control. Here is dependable equipment for increased production and lower costs in many plants. The Bellows Co., 222 West Market St., Akron, Ohio.

□ **49. WELDING, BRAZING**—"Buyers Guide to the Complete Line of All-State Alloys and Fluxes for Welding, Brazing, Soldering, Cutting, Tinning" tells everything a buyer needs to know to select alloys and fluxes that best meet his needs. All-State Welding Alloys Co., Inc., 273 Ferris Ave., White Plains, N. Y.

□ **50. SAFETY BELTS**—Bulletin CF-26 describes variety of safety belts including Scotchlite reflector belts. Belts are made of both leather and webbing material. Accessory equipment is described. Mine Safety Appliance Co., Pittsburgh 8, Pa.

□ **51. STEEL CASTINGS**—"Fundamentals of Steel Casting Design." Copy of this 32-page book which gives the basic principles of correct design and suggested applications where the use of steel castings can cut costs, is available from The Atlantic Steel Castings Co., 6th and Lloyd Sts., Chester, Pa.

□ **52. BELTING, CONVEYOR**—All types of conveyor and elevator belting are covered by Bulletin 3679, which is complete with tables, charts etc. for the selection of the right type of belt for a specific application. Thermoid Co., Trenton, N. J.

□ **53. DRY BLENDING**—Cat. No. 59 details application of Patterson Conical blender to dry blending operations,—powders, colors, pigments, minerals, fine and heavy chemicals, dyes, resins, etc. etc. For copy write to Patterson Foundry & Machine Co., E. Liverpool, Ohio.

□ **54. THIN S. S.**—"Paper-Thin Stainless for Light Vital Parts" shows where stainless steel .010 to .001" thick has been used and outlines the advantages it offers. Armco 17-7 PH thin-gage strip which has tensile strength comparable to best high carbon spring steel is described. Armco Steel Corp., Middletown, O.

(Please turn to page 24)

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(Continued from page 22)

☐ **55. PROTECTIVE COATINGS**

—Chemical resisting protective coatings are covered by new bulletin describing five groups. Coatings are resistant to acids, alkalis, petroleum and its derivatives, oxidants, salt solutions, alcohols, and many solvents. United Chromium, Inc., 100 E. 42nd St., New York, N. Y.

☐ **56. INDUCTION MOTORS** —

Bulletin 05B7550 details two-pole squirrel cage induction motors built for boiler feed pumps, oil pipe line pumps, centrifugal blowers, descaling pumps and other high speed drives. Allis-Chalmers Mfg. Co., 923 S. 70th St., Milwaukee, Wis.

☐ **57. FORK TRUCKS**—Accessory

data sheet on fork extensions for handling loads longer than those ordinarily carried on regular forks of lift trucks, is available from Towmotor Corp., 1226 E. 152nd St., Cleveland 10, Ohio.

☐ **58. HOT WATER**—Bulletin SM-

41, "Packaged Water Heating" details five sizes of all bronze steam mixer water heaters, —packaged units complete with all controls and accessories; also described is combination safety unit which supplies hot water at two or more controlled temperatures. O'Brien Steam Specialty Co., Inc., 385 Heferman Bldg., Syracuse 2, N. Y.

☐ **59. LUBRICATION**—Lubriplate

Data Book No. 1-50 tells about Lubriplate specialized lubricants which are produced in various types of fluids and greases for a wide diversity of industrial applications. They protect machine parts, (properly selected lubricant will not wash out of bearings), and make for economy in maintenance and operation. Fiske Brothers Refining Co., Lubriplate Divn., 129 Lockwood St., Newark 5, N. J.

☐ **60. POWER PACK**—Inductrol

Power Pack is detailed in Bulletin GEA 5571. This midget load center unit substation is specially designed for low voltage, regulated a-c lighting and power service in factories and laboratories. It incorporates in steel housing, an air circuit breaker, a dry-type transformer, and an air-cooled induction regulator. General Electric Co., Schenectady 5, N. Y.

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☐ **61. LUMBER**—The 1951 edition of the "Buyers Guide" includes information about rail service, items of lumber produced, and equipment of each mill. Southern Pine Assn., New Orleans, La.

☐ **62. PRODUCTION TOOLS** —

Eleven new Catalog bulletins and price lists replace literature previously published. No. 1-50, drill and tap chucks; 2-50, arbors and adaptors; 3-50, quick change chucks; 4-50, tap holders and drivers; 5-50 counterbores, countersinks and core drills; 6-50, adjustable adapters; 7-50 sleeves and sockets; 8-50, flating holders; 9-50, centers; 10-50 recessing tools; 11-50, work rest blades. Scully Jones & Co., 1956 So. Rockwell St., Chicago, Ill.

☐ **63. LIFTING MAGNETS**—Catalog B1401A describes new lightweight all welded lifting magnets; shows sizes, lifting ranges, dimensions and ratings; types of controllers are illustrated. Dings Magnetic Separator Co., 4740 W. Electric Ave., Milwaukee 46, Wis.

☐ **64. ELECTRIC MOTORS**—Bulletin 1215 covers new type QZE totally enclosed, non ventilated, squirrel cage induction motors built in NEMA standard frame 284; 7½ hp, 1800 rpm and 5 hp, 12 rpm motors, now in production. Conform to NEMA and ASA standards for totally enclosed machines. Ball bearings are of cartridge type. Fairbanks, Morse & Co., 600 So. Michigan Ave., Chicago, Ill.

☐ **65. POWDER-FASTENING TOOL**—Drive-It, powder actuated fastening tool is detailed in new

bulletin. It is claimed to be super-safe, to have 40% greater penetrating power, to eliminate most of the bang. Tool weighs less than six pounds. Powder Power Tool Corp., 0719 S. W. Woods St., Portland 1, Ore.

☐ **66. MILLING CUTTERS**—Milling cutters and tracers for Keller machines are detailed in new bulletin—spiral fluted, taper with straight shanks, extension spiral fluted, straight fluted, profiling cutters plain ends and end cutting, end mills, diamond point cutters, etc. Pratt & Whitney, West Hartford 1, Conn.

☐ **67. CARBOLOY TOOLS, PARTS**—New and unusually complete

catalog GT-250 of carbide tools and parts takes the informative type of approach. It lists the tools, etc., and tells how to select and apply them. Also non-tool carbide parts are described and illustrated, such as tubing, guide bushings, valve seats, gage blanks, etc. Carboloy Co., Detroit 32 Mich.

☐ **68. BALL JOINTS**—"Flexible Ball Joints" is title of 16-page bulletin No. 215 on swing, swivel, revolving and other types of movable joints for use in piping, power, process, heating, chemical or hydraulic service. Barco Manufacturing Co., Dept. J-31, 1801 Winemac Ave., Chicago 40, Ill.

☐ **69. PLASTIC MOLDING**—"Fully Automatic Molding of Thermo-setting Plastics", booklet of 24 pages, shows typical applications for automatic molding and its adaptability to wide range of plastics products. Case histories are described. P. J. Stokes Machine Co., 5900 Tabor Road, Philadelphia 20, Pa.

☐ **70. LIQUID CHILLERS**—Flow-Cold liquid chillers, self contained, compact units, for use in industrial operations where cooling will increase efficiency, are detailed in bulletin issued by Acme Industries, Inc., Jackson, Mich.

☐ **71. BALL BEARINGS**—20th Edition of New Departure ball bearing catalog is now available. Selection of bearing type and size for various conditions of load and speed is considerably simplified and illustrated by examples. Copy available from New Departure Divn., General Motors Corp., Bristol, Conn.

(Please turn to page 162)



POP'S School of Filing



THERE'S "WRONG-WAY" HARRIGAN BURNING UP FILES NOT INTENDED FOR STAINLESS STEEL!

YEH, AN' POP'S ABOUT TO BURN HIS BRITCHES WITH A BLISTERIN' LESSON ON USIN' THE RIGHT FILE FOR THE JOB!

AS A FILE DRIVER I'D TIME 'WRONG-WAY'S' SPEED AT ABOUT A FILE A MINUTE!!

STAN RANDALL

LIKE any foreman interested in high production with minimum tool wastes, Pop can't be blamed for "blowing his top" over the sad scene enacted above. Using the wrong file for the job is as costly a tool abuse as using any file carelessly. Take stainless steel, for example:

Stainless steel is a tough, dense metal which tends to have a wearing effect on all cutting tools—and files are no exception. Better results are obtained when Nicholson or Black Diamond files "For Stainless Steel" are selected. These are made with

specially sharpened teeth to assure faster cutting and longer file life. They are made in the same types and sizes as regular-purpose files. "For Stainless Steel" is stamped on the tang. Sold through industrial distributors.

THE NATIONAL DEFENSE PROGRAM calls for again conserving steel. You can aid by making files last longer—(1) through correct use and proper care of files and (2) through use of *The right file for the job*. The following booklets, handed to purchasing and production heads, are valuable helps. Write for as many copies as you can use judiciously.

"TEN SPECIAL FILE TYPES"

"FILE PHILOSOPHY"
(on kinds, use and care of files)



NICHOLSON FILE CO. • 28 ACORN STREET • PROVIDENCE 1, RHODE ISLAND
(In Canada, Port Hope, Ont.)



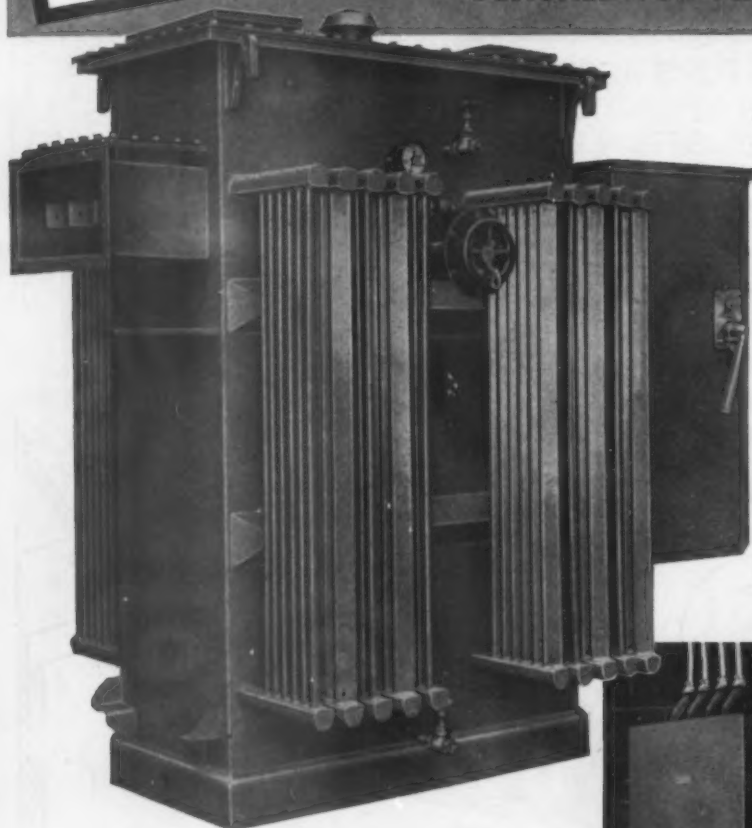
NICHOLSON . . . A FILE FOR EVERY PURPOSE

Wagner®
TRANSFORMERS
 ... the choice of leaders
 in industry

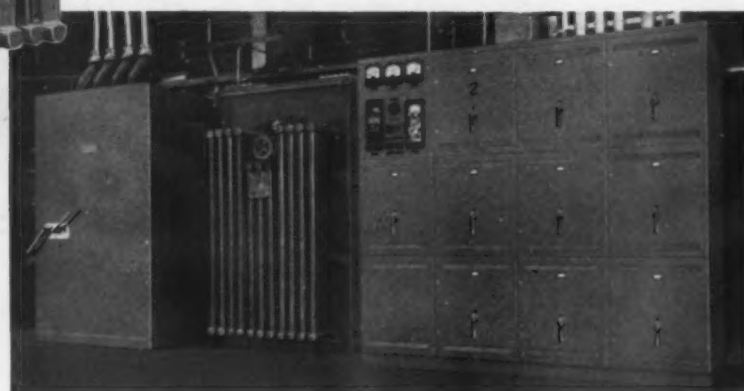
Wagner

UNIT SUBSTATION TRANSFORMERS

DESIGNED FOR PLANT POWER DISTRIBUTION SYSTEMS



Wagner-equipped unit substation
 in a synthetic textile plant.



The ever-increasing demand for electric energy to power today's stepped-up production presents a critical problem. The answer to this problem has been found in load-center power distribution systems. The vital part of the load-center system is the transformer. If a switch or circuit breaker fails, only a part of the system is affected—but if the transformer fails, the entire system is dead.

Wagner Unit Substation Transformers assure a continuous, dependable flow of power. They are carefully designed to meet your distribution requirements, and are available with various types of entrances and controls for the high-voltage circuits, and with proper throats on the secondary side to connect to any make of switchgear, in the usual range of ratings up to 2000 kva.

Dry-Type Indoor Transformers

Wagner now furnishes three-phase dry-type transformers in ratings up to 2000 kva in the 15 kv class and below. These units are compactly housed in neat, attractive enclosures, which can be arranged to include primary and secondary switchgear compartments to form readily accessible, closely-coupled unit substations. Relatively light in weight, so that they can be used in multi-story buildings, they are readily adaptable to any installation requirement.

WAGNER ELECTRIC CORPORATION
 6360 Plymouth Ave., St. Louis 14, Mo., U.S.A.

ELECTRIC MOTORS • TRANSFORMERS • INDUSTRIAL BRAKES
 AUTOMOTIVE BRAKE SYSTEMS — AIR AND HYDRAULIC

BRANCHES IN 31 PRINCIPAL CITIES

Wagner
 Electric Corporation
 1891 **WE** 1951

SUPER-7 A AND B BELTS

Strong Cord structure impregnated with live rubber.

SUPER-7 C, D, AND E BELTS

Famous grommet construction. Nosplices where failure can start.

PRECISION MOLDED — Every belt is accurately proportioned and molded to run smooth, cool and true.

TEXROPE

Greatest Name in V-Belt Drives

SHOCK RESISTANT — Resilient cushion of rubber, acts as shock absorber, protects cord from stresses.

POWERFUL — Cords are of rayon, firmly twisted, accurately placed, impregnated with rubber to minimize friction.

Cool Running... LONG LIVED!

SUPER-7 V-belts give long, satisfactory service even under bad conditions of load, shock and grit.

Tough, double-wrapped cover bias cut for elasticity and impregnated with rubber. Effectively seals out dust, grit, moisture; takes the wear; keeps the belt in shape; and protects cord structure.

But you get more than good belts when you standardize on *Super-7* V-belts. You also get the benefit of the greatest V-belt experience in the world both in the field and factory. You are assured of exactly the right drive for longest life from the wide variety of types and sizes available.

High Capacity Belts

Where space is limited or other special

conditions demand heavier duty, the high capacity belt can be furnished in A, B, C, D, and E sections . . . Extra strong cords, special rubber cushion and tough Neoprene cover give them 40% greater capacity than standard belts at proportionately higher price.

V-Belt Drive Headquarters

Your nearby Allis-Chalmers Authorized Dealer or Sales Office can serve all your V-belt needs, whether they be new or replacement V-belts; standard and variable speed sheaves; or speed changers.

Get your copy of the revised 120 page *Texrope* Pre-Engineered Drive Manual from your A-C Dealer or Sales Office or write for Booklet 20B6956A. Allis-Chalmers, Milwaukee 1, Wisconsin.
A-3291

Texrope and Super-7 are Allis-Chalmers trademarks.

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Sold . . .

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by Allis-Chalmers Authorized Dealers, Certified Service Shops and Sales Offices throughout the country.



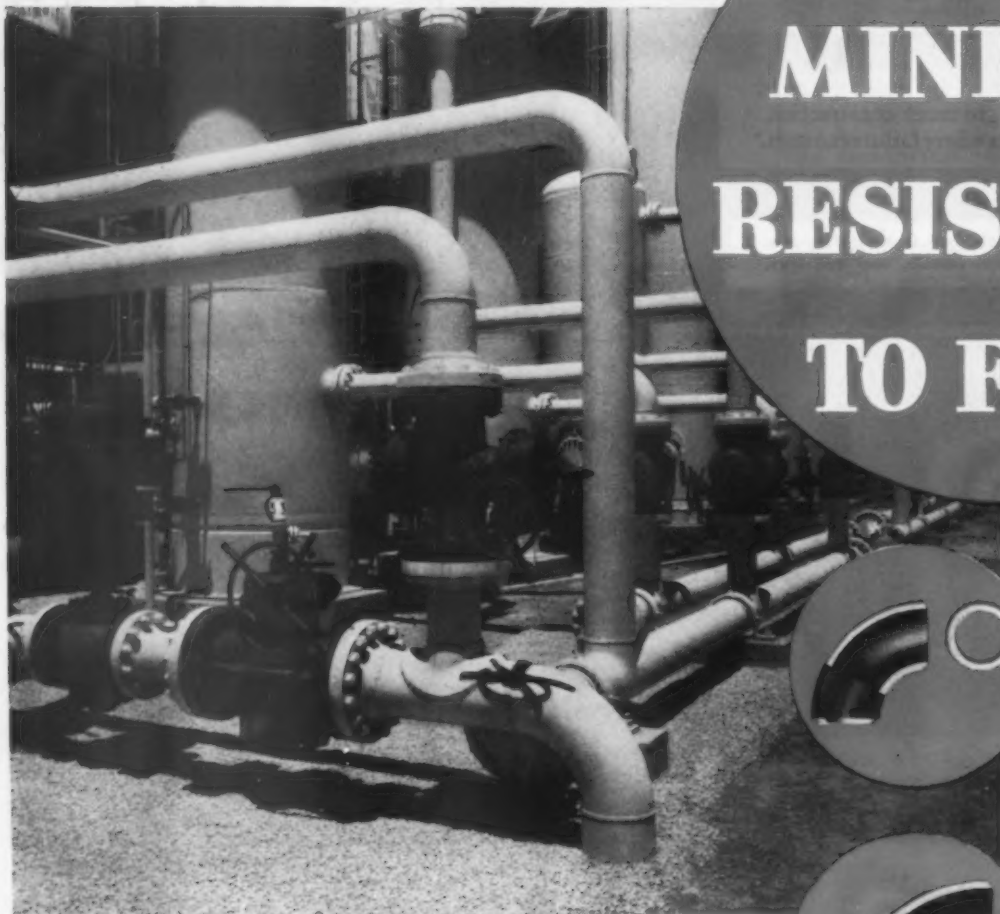
MOTORS — ½ to 25,000 hp and up. All types.

CONTROL — Manual, magnetic and combination starters; push button stations and components for complete control systems.



PUMPS — Integral motor and coupled types from ¼ in. to 72 in. discharge and up.

Grinnell Welding Fittings for



Grinnell Welding Fittings on towers of natural gasoline plant.

MINIMUM RESISTANCE TO FLOW

Any qualified welder can make welds quickly and easily with Grinnell welding fittings. These fittings are made by a hydraulic forging process that assures uniform wall thickness at all points and true circularity throughout. Of seamless, one-piece construction, they can be cut at any angle to match up with standard weight, extra strong and heavier wall pipe in I. D. or O. D. sizes. Pressure-temperature ratings are equal to or greater than those of seamless steel pipe. Grinnell welding fittings are process stress-relieved.

Full data on the complete line of Grinnell carbon steel butt welding fittings and forged steel flanges is contained in the Grinnell Welding Fittings Catalog.



SEND FOR THIS CATALOG

GRINNELL

WHENEVER PIPING IS INVOLVED



GRINNELL COMPANY, INC., Providence, R. I. Warehouses: Atlanta • Billings • Buffalo • Charlotte • Chicago
Cleveland • Cranston • Fresno • Kansas City • Houston • Long Beach • Los Angeles • Milwaukee • Minneapolis • New York
Oakland • Philadelphia • Pocatello • Sacramento • St. Louis • St. Paul • San Francisco • Seattle • Spokane

TRUE CIRCULAR SECTION

True circular section at all points makes a Grinnell fitting easy to align and weld . . . no distortion or flattening to affect flow adversely.



FULL EFFECTIVE RADIUS

Pressure loss through Grinnell welding elbows is held to a minimum because of the full, effective sweep of the radius.



SMOOTH, CLEAN INSIDE SURFACE

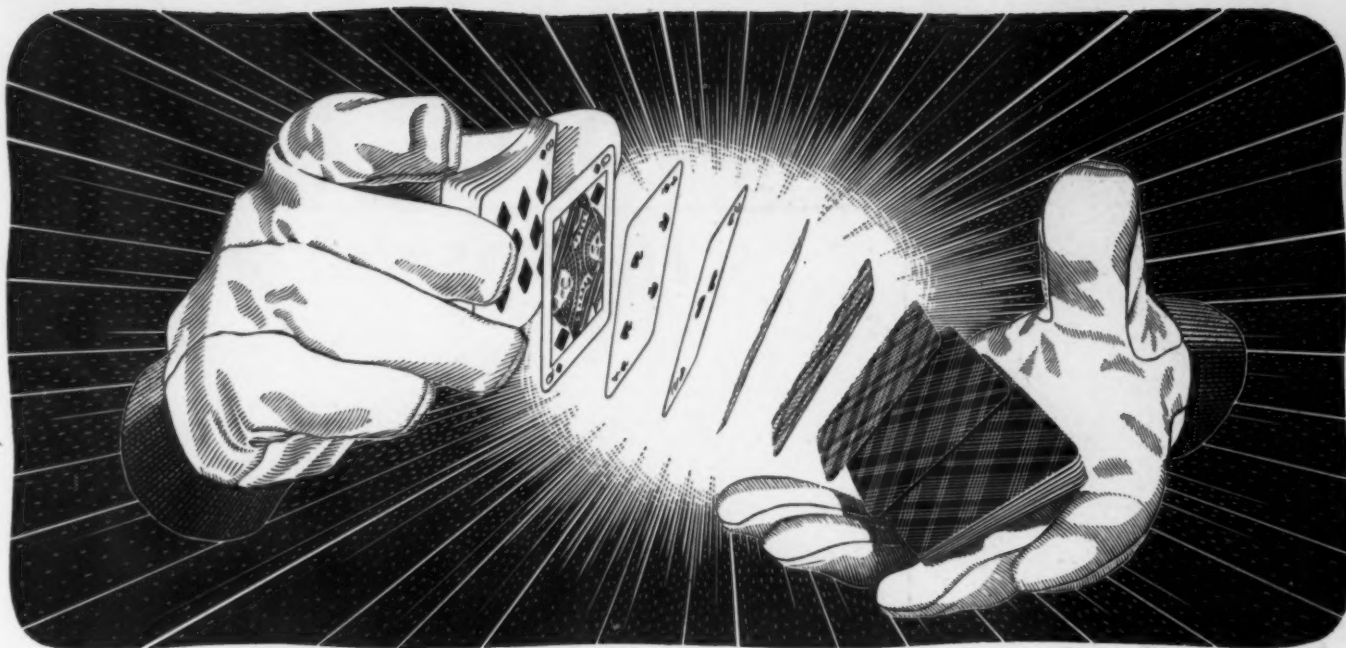
Grinnell fittings have uniformly smooth inner walls . . . no waves or ridges to cause turbulence or accelerate erosion or corrosion. No pockets to trap solids or foreign matter.



EASY, SWEEPING TURNS

In Grinnell welding tees, the corners where the outlet joins the run are well-rounded and perfectly smooth to minimize resistance to flow and to prevent trapping.





nimble fingers wear Riegel gloves



LEATHER PALM GLOVES

For extra protection, longer wear and working comfort... available in a complete style range with a wide choice of fabric and leather combinations... knit wrist, safety and gauntlet cuff.



CANTON FLANNEL GLOVES

The best glove for general all-round work. Available in a full range of weights and styles for every need... including knit wrist, gauntlet cuff, band top and reversible.

Nimble fingers can be quicker than the eye, when they're wearing RIEGEL Work Gloves. You'll find them made for real working comfort...plus economy, long wear and all-around quality.

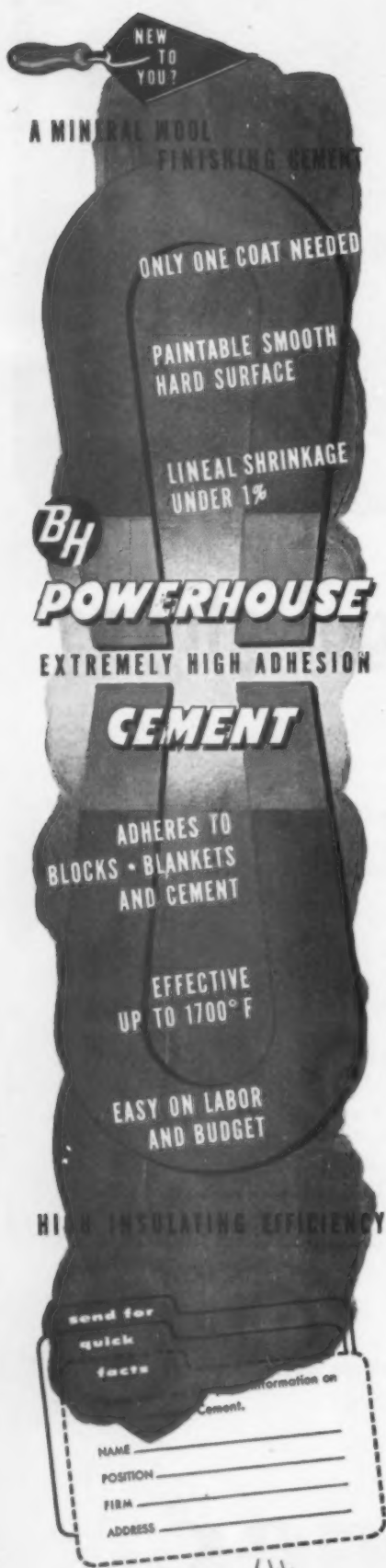
Every pair is made to the highest of standards. We check on their quality every inch of the way...for Riegel Gloves (and no other brand) are manufactured from raw cotton to finished glove...in the same plant...by the same company.

WRITE FOR OUR NEW CATALOG—a complete line of styles to choose from—for any job—no matter how tough!

RIEGEL TEXTILE CORP., 342 Madison Ave., New York 17, N. Y.

Riegel

WORK GLOVES



BALDWIN-HILL COMPANY
407 BREUNIG AVE. TRENTON 2, NEW JERSEY

F.O.B.



FILOSOFY OF BUYING

If the reception clerk should some day send in to you an oversize business card—specifically, a standard 3x5 file card with the name of the salesman's company prominently shown near the top margin, followed by a concise summary of the products or services offered—don't rush to the conclusion that said salesman and/or his company have suddenly become billboard-minded. The chances are that he is applying an idea recently developed by David L. Keith, former purchasing man now in public relations work at Peoria, Illinois. If so, you do him an injustice by regarding the card as "oversize"—it's sized for better service. Mr. Keith tells about the idea in the following letter:

"Back in the thirties, when I was a purchasing agent, I experienced my first annoyance with calling cards. Like many another P.A., I 'solved' the problem by having a secretary transfer all calling cards onto 3x5's for filing purposes. Having once fallen into the trap, the plague of organization of information into files periodically reaches the fetish proportion.

"In the forties, my work switched over to the other side of the fence. My acquired (but deep) affection for files (of all sizes) retarded the development of the obvious. Then

one fine day a client requested that we design a calling card for him. We went through the usual public relations motions: Typography, slogans, trademarks, layout, color, embossing—the client would be served well.

"For some reason, we set it aside for a day or two—just long enough to see the obvious: A calling card should serve *the person* called upon. Two and two suddenly became four, instead of three. The enclosed PSA card is the result.

"The noble experiment has had some interesting results. The PSA man lays the 3x5 card down on the desk, and in *every* instance the one called upon picks up the card and reads it *all* before looking up again. An unexpected bonus!

"The T. P. & W. Railroad is now using them—achieving a reputation for progressiveness even when the customer's traffic man does not have a 3x5 card file. And their cards do serve better—both seller and buyer.

"From the salesman's point of view, there are the problems of what to have on the card, how many cards, etc. From the purchaser's standpoint, there is only one problem: Will he request salesmen to send him 3x5's? Even typed cards will do. The salesmen that call on us have been happy to do so, and

TOLEDO, PEORIA & WESTERN R.R.
115 Broadway — (Barclay 7-6384)
New York, N. Y.



ARTHUR J. MILLER, T.M.
J. J. DONNELLY
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GENERAL OFFICES . . . PE
Open 24 hours a day — 7
J. RUSSEL COULTER, Pres. E.
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PERSONNEL SERVICES ASSOCIATES
1205 Jefferson Building
Peoria 2, Illinois

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Specialized employment agency supplementing personal interview by individually selected testing, background research as indicated, at no cost to the employer.

Designed specifically to reduce turnover, save employer's time, insure interest and to produce qualified personnel to meet individual job requirements.

some are having them printed; 3x5's and printers are available everywhere.

"Too large? Uh-uh! It's really not a large card but a small advertising piece—to the salesman, an advertisement that he understands P.A. problems and wants to help to solve them.

"My regards to all who try it. I'd like to learn of their experiences and opinions, favorable or unfavorable."

Any comments which F.O.B. readers may care to make concerning this idea will be welcomed, and will be passed along to Mr. Keith.

● ●

A MAJOR accomplishment of standardization is reported from Washington, in connection with the revision of the Federal Supply Catalog. Where once the appalling number of 5,316,000 separate items were listed for the military and civil supply systems, only 3,000,000 will appear in the new compilation, a reduction amounting to 43½%. The greater part of this achievement has been due to *name standardization* of supply items, a project that is being actively pushed by the Armed Forces, whose needs account for about five-sixths of the total list. Purchasing is a complicated job at best, covering a tremendous range of material needs, and there's no sense in complicating it still further by describing each item by two or three different terms.

● ●

THE diversity of items to be purchased, even in a smaller operation, has driven one purchasing agent to verse. When a reporter for the Omaha *World-Herald* asked City P.A. Ivan Swanson about his job, the answer was given in rhyme:

*Baffles and slingers and shackles
and shims,
Elbows and knuckles and nuts;
Collars and couplings and throttle
shafts,
Veneers, axles, and butts.*

● ●

STARTING with last month's issue, we moved the table of contents up to page 5, with the idea of making it easier to find. We wondered whether readers would notice the change. The answer wasn't long in coming. Several comments have been received, and so far all are in favor of the move.



There Is More to Wire Rope Than Meets The Eye—

***it's the invisible
"ingredients" that
make the difference.***

Other than its one Red-Strand, a "HERCULES" Wire Rope would look pretty much like any other rope having no distinguishing mark. But there is a difference! And that difference is due to a "thousand and one" *invisible* factors. It is made possible by setting up and rigidly maintaining exacting standards... by utilizing our almost 100 years of manufacturing experience in the designing and fabrication of wire rope... by strictly following the principle of "quality first!"

As it has never been possible to actually see the numerous properties that make one wire rope outlast another, we originated—in 1886—the idea of painting one strand of "HERCULES" Wire Rope red, and since that time the Red-Strand has not only been a mark by which this rope could be identified, it has been our constant guarantee that its high quality is ever maintained.

Yes, there is more to "HERCULES" Wire Rope than meets the eye, but you can accept, with confidence, the assurance that the Red-Strand provides.

MADE ONLY BY



A. LESCHEN & SONS ROPE CO.

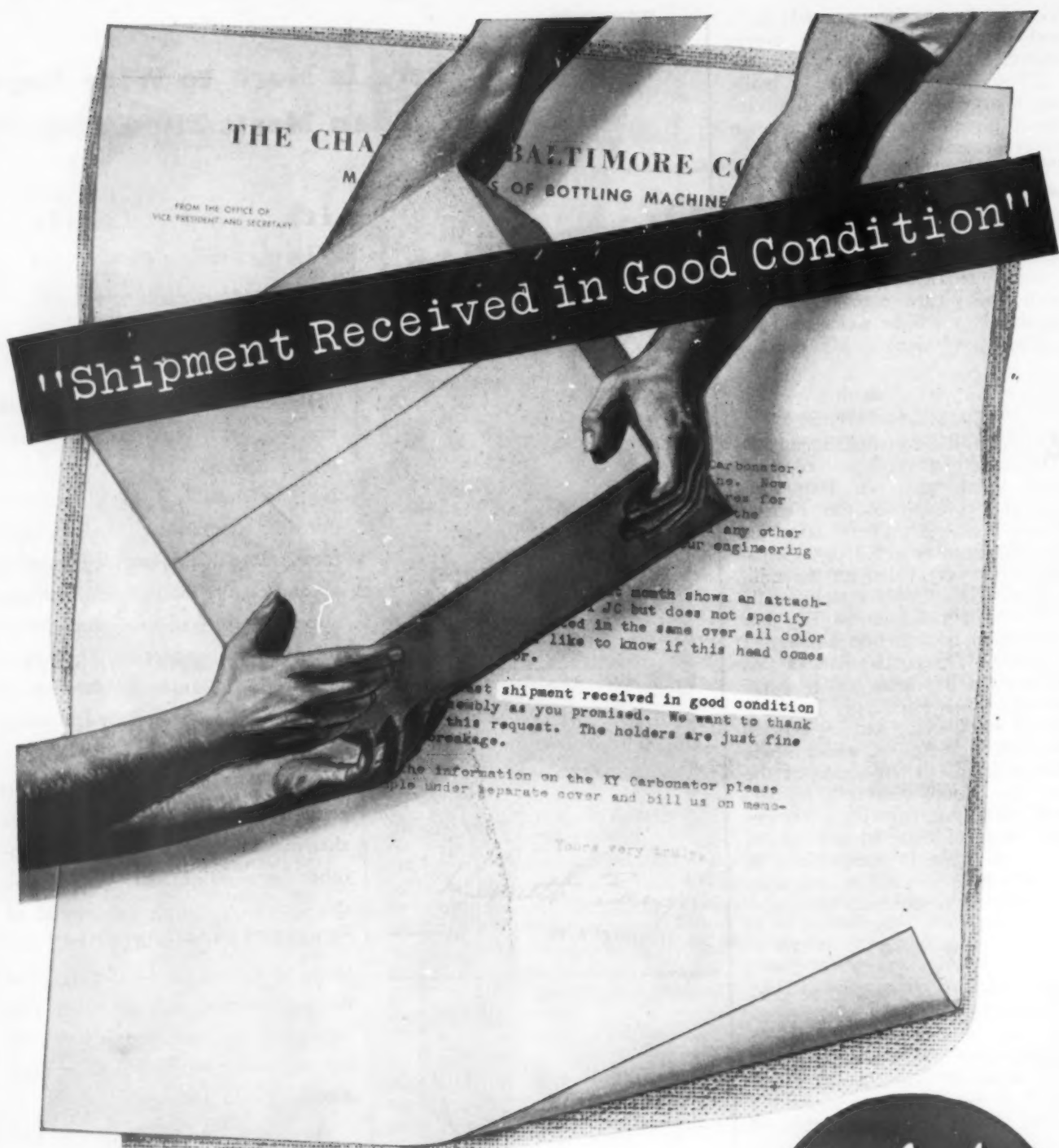
ESTABLISHED 1857 5909 KENNERLY AVE. • ST. LOUIS, MO.

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Los Angeles 21

San Francisco 7
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**We Invite
Your Inquiries**



That's the pay-off line in this letter — the good relations builder! "Shipment received in good condition." When your product is packaged in Gaylord boxes — you know your product is better protected — All the Way!

For years Gaylord boxes have been protecting the products of many of the country's leading manufacturers.

GAYLORD CONTAINER CORPORATION, General Offices: **ST. LOUIS**

New York • Chicago • San Francisco • Atlanta • New Orleans • Jersey City • Seattle • Indianapolis • Houston • Los Angeles
Oakland • Minneapolis • Detroit • Columbus • Fort Worth • Tampa • Cincinnati • Dallas • Des Moines • Oklahoma City • Greenville
Portland • San Antonio • Kansas City • St. Louis • Memphis • Bogalusa • Milwaukee • Chattanooga • Weslaco • Appleton
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IGNITRON
"Valves" the heavy current to the welding electrodes

FOR OUTPUT AROUND THE CLOCK...

THYRATRON
Times the resistance-welding shot with split-second precision



For full-time production by your welding machines . . . get in touch with your G-E tube distributor!

A resistance welder won't operate if its control tubes are out of order. So, for continuous output, install tubes which are dependable, will last! That means G-E . . . General Electric builds more industrial electronic tubes than any manufacturer—a leadership that rests squarely on factory-proved tube performance, on demonstrated value in terms of long life.

Who supplies these dependable tubes? Your local G-E tube distributor. They're available in

types that meet *your* welder-socket needs, for the range of G-E tube sizes and capacities is wide.

Service by your G-E distributor? The best. When you need a welding thyatron, ignitron, or other type, you need it *now*. No other source of tube supply matches your G-E tube distributor in alertness to your emergency requirements.

Assured performance? Every G-E tube carries the important General Electric warranty—*your investment protection*. Help guard against costly welder shutdowns by consulting with your G-E tube distributor! Your General Electric electronics office gladly will cooperate to put you in touch with him. Or write *Electronics Department, General Electric Co., Schenectady 5, N. Y.*

G-E ELECTRONICS OFFICES ARE LOCATED IN THE FOLLOWING CITIES:

ATLANTA 3, GEORGIA
187 Spring Street, N. W.
BOSTON 1, MASSACHUSETTS
75 Federal Street
CHICAGO 54, ILLINOIS
1123 Merchandise Mart Plaza
CLEVELAND 14, OHIO
710 Williamson Building
Euclid Avenue and Public Square
CINCINNATI 2, OHIO—215 West Third Street

DALLAS 2, TEXAS
Norman Building
Ross and Lamar Streets
DETROIT 26, MICHIGAN
2511-13 Book Tower
HARTFORD 3, CONNECTICUT
410 Asylum Street
HOUSTON 2, TEXAS
4604 South Main Street

KANSAS CITY 6, MISSOURI
106 West Fourteenth Street
LOS ANGELES 14, CALIFORNIA
Suite 1300-1301
Security Title Ins. Building
530 West Sixth Street
MINNEAPOLIS 2, MINNESOTA
12 South Sixth Street

NEW YORK 22, N. Y.
570 Lexington Avenue
PHILADELPHIA 2, PENNSYLVANIA
1405 Locust Street
SAN FRANCISCO 6, CALIFORNIA
235 Montgomery Street
SEATTLE 11, WASHINGTON
710 Second Avenue

WASHINGTON 5, D. C.—806 Fifteenth Street, N. W.

You can put your confidence in—

GENERAL  ELECTRIC

Backstand Method. Saves Time!

**Le Roi Co. cuts finishing
time on forged handle
from 5 minutes 11 seconds
to 1 minute 32 seconds**

Problem: The Le Roi Company, in Cleveland, Ohio, used set-up wheels to finish forged paving breaker handles. This finishing operation required 5 minutes 11 seconds on the average per handle . . . was too long, too costly.

Solution: The Le Roi Company switched from the set-up wheel to the backstand belt method for this finishing job.

Result: An Armour abrasive belt was used and finishing time was reduced to 1 minute 32 seconds per forged handle . . . saving 3 minutes 39 seconds for each handle!

Manufacturers of hundreds of different industrial and consumer items have proved that the backstand belt method is more efficient and more economical than the set-up wheel.

If you are grinding, polishing or finishing flat or contoured surfaces, cast pieces, stamped pieces or forged pieces the backstand belt method can help you with your production problems.

To learn more about the many advantages of the backstand belt method, write today for our free booklet.

We recommend buying through your industrial distributor



MAIL THIS COUPON TODAY

Please send me the booklet "Facts about Backstand Belt Grinding and Polishing."

Name

Title

Firm

Address

City Zone State

Armour's abrasive belts are only part of a complete line of abrasives built to rigid quality specifications. There are sheets, rolls, discs and other more specialized shapes.

ARMOUR

Coated Abrasives Division

SHEETS • ROLLS • BELTS • DISCS

Armour and Company
North Benton Road • Alliance, Ohio

Know Your Plastics

FOR ELECTRICAL INSULATION PARTS REQUIRING

Low Power Factor

Low Loss Factor

High Resistivity

Dimensional Stability

Low Water Absorption

Choose BAKELITE "Low-Loss" Phenolic Molding Materials

The BAKELITE line of plastics contains a group of Phenolic materials developed expressly for difficult electrical insulating jobs. These superior materials offer custom molders and product designers the needed properties, electrical and mechanical, for communications equipment, marine electrical parts, and automotive applications.

RANGES OF VALUES FROM ELECTRICAL TESTS

Dielectric Strength (D149-44)	
S/T 1/8", volts/mil	300-400
Dielectric Strength (D149-44)	
S/5 1/8", volts/mil	250-350
Volume Resistivity	
(D257-46), meg.-cms.	10 ⁶ -10 ⁸
Dielectric Constant (D150-47T)	
60 cycles	4.8-6.5
1,000 cycles	4.6-5.5
1,000,000 cycles	4.5-5.2
Power Factor (D150-47T)	
60 cycles	0.01-0.07
1,000 cycles	0.006-0.05
1,000,000 cycles	0.005-0.02
Loss Factor (D150-47T)	
60 cycles	0.05-0.46
1,000 cycles	0.03-0.28
1,000,000 cycles	0.02-0.10

RANGES OF VALUES FROM MECHANICAL TESTS

Compressive Strength (D695-44), 15,000 to 24,000 psi. Tensile Strength (D651-48) (1/8"), 5,000 to 7,000 psi. Flexural Strength (D790-45T), 9,000 to 12,000 psi. Modulus of Elasticity in Flexure (D790-45T), 25-35 x 10⁵ psi.

RANGES OF VALUES FROM MISCELLANEOUS TESTS

Other property ranges of BAKELITE "Low Loss" Phenolics are as follows: Molded specific gravity, 1.66 to 1.92; thermal coefficient of expansion, linear per deg. C. (D696-44), 2 x 10⁻⁵; heat distortion temperature (D648-45T), 230-350 deg. F.; water absorption (D570-42), per cent gain in weight, 0.01-0.07.

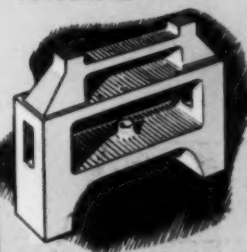
Address inquiries to Dept. BR-25.

BM-262 NATURAL "LOW LOSS" MATERIAL

Properly molded, it is the top quality low-loss phenolic. Requires greater care in molding than other low-loss materials. Supplied on a "made to order" basis at slightly higher cost than the other materials.

Typical uses: Parts for radio receivers and amplifiers, electronic condensers, audio oscillators, signal generators.

Recommended to molders and manufacturers desiring approval under MIL-P-14A



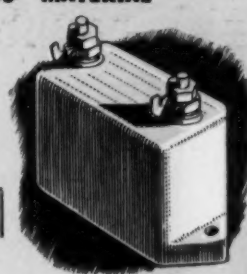
BM-16981 NATURAL "LOW LOSS" MATERIAL

Has exceptionally good electrical properties which are retained under moist service conditions. Easier to mold than BM-262, and somewhat lower in cost.

Typical uses: Electronic capacitors, resistors, and parts for radio, radar, X-ray and similar equipment.

Recommended to molders and manufacturers desiring approval under MIL-P-14A

The black counterpart of this material is BM-17080.

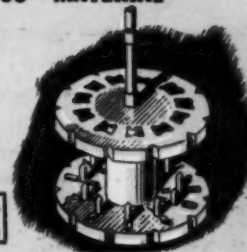


BM-17748 NATURAL "LOW LOSS" MATERIAL

Has greater moldability than either BM-16981 or BM-262. Good electrical properties under moist service conditions. More stable dimensionally than most phenolic molding materials.

Typical uses: Coil forms, vacuum tube bases, condenser housings and resistors.

Recommended to molders and manufacturers desiring approval under MIL-P-14A



BM-13017 NATURAL "LOW LOSS" MATERIAL

Has greatest moldability of all materials in the "low loss" group. Has excellent electrical insulating properties in general, although not intended for high frequency service. Highly resistant to moisture. Dimensionally stable.

Typical uses: For less exacting electrical service such as automotive ignition parts and various types of resistors.



BAKELITE

Phenolic PLASTICS

BAKELITE DIVISION
Union Carbide and Carbon Corporation
30 East 42nd Street, New York 17, N. Y.

Built for your safety and working comfort



SHORT BOOTS come in neoprene rubber to resist oil, grease and acids. Bar-Flex arch-supporting shanks, steel safety toes, Shock-proof Cushioned Insoles. Also Tempered Rubber for general use with cleated-type soles.

HIGH KWIK ARCTICS in all neoprene to resist oil, grease and acids. Your choice of regular cleated-type soles or new molded anti-skid soles.



U. S. Specialized Industrial Footwear has been developed as a result of years of working *for* and *with* industry.

If you are on your feet all day, the Bar-Flex soles give support under the arch; they can't sag. If you handle heavy loads, you'll want the safety of the Steel Toes. And these are only two of many specialized industrial features in U. S. Footwear.



BAR-FLEX SOLES REALLY SAVE ARCHES

Exclusive Bar-Flex soles are molded with extra bar cleats for solid arch support. Their cleated-type construction gives you added anti-slip safety down the whole length of your feet.



U N I T E D S T A T E S

—Engineered for special jobs



U. S. ROYAL WORK SHOES with steel toes, have cleated-type soles for safety, steel shanks to give your arches long hours of comfortable arch support, and Shockproof Insoles. Also with plain toes. Tough Tempered Rubber.



STEEL TOES WITHSTAND 2,000 POUNDS

Engineered like an arch, they've saved many a man's toes. Note scientific "U. S." construction.

LEGGIN BOOTS go over your shoes. Lightweight, rollable, they fold small to pack and carry. Knee or thigh lengths.



FLEXON RUBBERS offer high-cut protection in tough Tempered Rubber or all neoprene to resist oil, grease, acids. Molded anti-slip soles. Easy-adjusting stretchable tops.



U. S. ROYAL SNUGLACE BOOTS with steel toes, have flexible, ankle-fitting uppers with lace adjustment at top. Bar-Flex arch-supporting shank and non-skid sole. Shockproof Cushioned Insoles.

R U B B E R C O M P A N Y

ROCKEFELLER CENTER, NEW YORK

MARCH, 1951

Want Additional Product Information? See Page 19.

37



**"Like finding
extra screws
in every box!"**

"At a time when a shortage of screws can very well set the limits of production, P-K* quality is more important to us than ever. Every screw is formed and hardened properly to drive right and hold right. There are no 'duds', and, believe me, that's like finding extra screws in every box!"

P-K will help in other ways to stretch your screw supply

P-K Assembly Engineers will help you in every way possible to adjust your assemblies to limited supplies. You may be able to use standard screws in place of hard-to-get "specials". By simplifying assemblies, you can sometimes use fewer screws without sacrifice of strength. Reducing multiple head styles, and using fewer diameters, with longer or shorter screws as needed, will also often help you to get improved deliveries.

Parker-Kalon, originators and leading producers of Self-tapping Screws, stand ready to apply their long experience to your most difficult problems of planning and procurement. Parker-Kalon Corporation, 200 Varick Street, New York 14, N. Y.

Sold through accredited Distributors
*TRADE MARKS REG. U.S. PAT. OFF.



The Original
PARKER-KALON* SELF-TAPPING SCREWS

A TYPE AND SIZE FOR EVERY METAL AND PLASTIC ASSEMBLY

For YOUR NORMAL NEEDS

LYON offers more than 1500 regularly cataloged items of steel equipment engineered to meet your civilian or defense production requirements. See list below.

For DEFENSE SUBCONTRACTS

Complete sheet metal facilities to handle gauges 10 to 24. Two strategically located plants, 1500 trained workers, our own toolrooms, 3800 contracts in World War II.

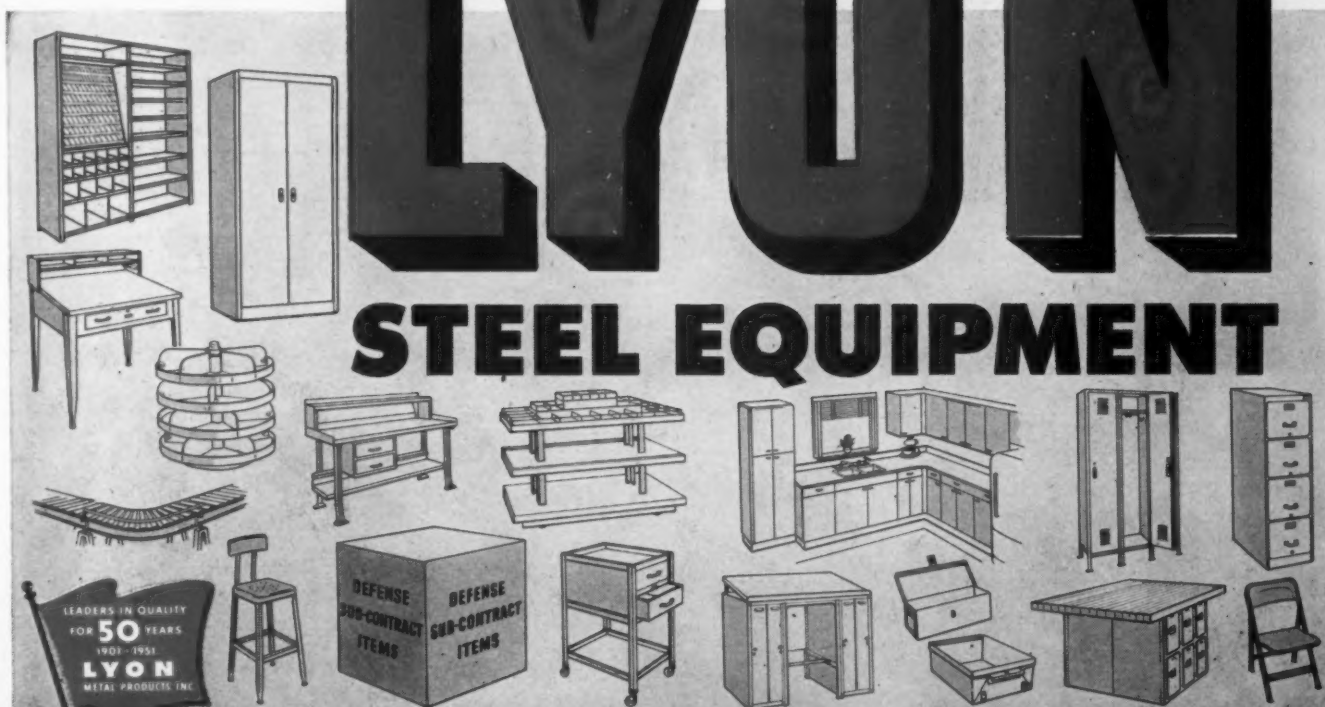
2 STRATEGIC PLANTS . . . AURORA, ILL., AND YORK, PA.

LYON METAL PRODUCTS, INCORPORATED

General Offices: 333 Monroe Avenue, Aurora, Illinois

Sold Nationally through Factory Branches and Dealers

LYON STEEL EQUIPMENT



A PARTIAL LIST OF LYON PRODUCTS

- Shelving
- Kitchen Cabinets
- Conveyors
- Economy Locker Racks
- Display Equipment
- Filing Cabinets
- Service Carts
- Tool Stands
- Lockers
- Cabinet Benches
- Bar Racks
- Flat Drawer Files
- Drawing Tables
- Folding Chairs
- Sorting Files
- Shop Boxes
- Stools
- Storage Cabinets
- Tool Boxes
- Toolroom Equipment
- Revolving Bins
- Work Benches
- Drawer Units
- Tool Trays
- Bin Units
- Welding Benches
- Parts Cases
- Wood Working Benches
- Hanging Cabinets
- Bench Drawers
- Hopper Bins
- Shop Desks



Look what's ahead-Southwest

Diesels...Diesels and more Diesels to give you better, faster, smoother freight and passenger service.

1951 will see us *really* on the run . . . on the run with Diesel power on all major freight and passenger trains.

Yes sir, we're "re-doing" Katy service . . . blending the MODERN and the TRADITIONAL . . . the modern, heavy duty smooth hauling efficiency of new, giant road Diesels with the traditionally reliable Katy service the Southwest has known right down the line, for almost 80 years.

And, that's not all. There'll be more Diesel yard switchers working to shave minutes from terminal transferring times. There'll be many equipment and

service improvements to speed your receiving dates . . . simplify your shipping schedules.

The Katy is quickening the pace. Stepping up the action for a vigorous Southwest of an alerted nation. In 1951 we continue expanding our service to you . . . This is our answer to your transportation problem.

Your local Katy representative will be glad to tell you even more about Katy's many new plans . . . and how you may benefit by shipping Katy, Southwest.





the **DIRTIER** the better
for **LAN-O-KLEEN!**

DIRT that's really hard to remove . . . that's deeply imbedded in workers' hands . . . that irritates cuts and abrasions—directly affects production figures! Think of the materials your present cleaner won't remove: graphite and metallic dust . . . heavy grime and lubricants . . . even common soil and office dust—no matter how hard you scrub!

LAN-O-KLEEN, the industrial soap powder, is designed for "heavy-duty" dirt removal. A fine corn meal base sponges out the pores . . . while thick suds sweep away surface dirt. As water is added, soothing Lanolin spreads over the skin, leaving hands fresh-feeling and clean as a whistle. Its soothing emollient action won't aggravate cuts and bruises. Further, Lan-O-Kleen and the sturdy Lan-O-Kleen dispenser are a dollar-saving combination—as a West representative can easily demonstrate.

LAN-O-KLEEN the industrial hand cleaner containing **LANOLIN**



Show me the
hand cleaner
that will
remove
stubborn dirt!

West Disinfecting Company, 42-16 West Street, Long Island City 1, N. Y.
(64 Branches in the U. S. and Canada)

Gentlemen: I'd like to have a local WEST representative come out and give me a demonstration of Lan-O-Kleen.

Mr. _____ Position _____

Company _____

Address _____

City _____ Zone _____ State _____

2

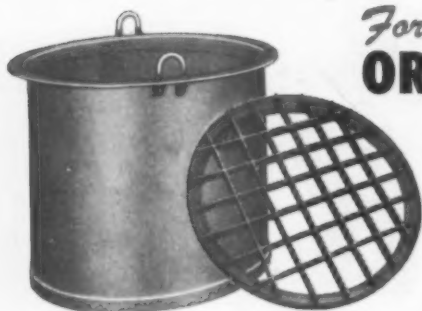
ROLOCK

FABRICATED

ALLOYS

HEAT AND CORROSION
RESISTANT

For
ORDNANCE Heat Treating PICKLING

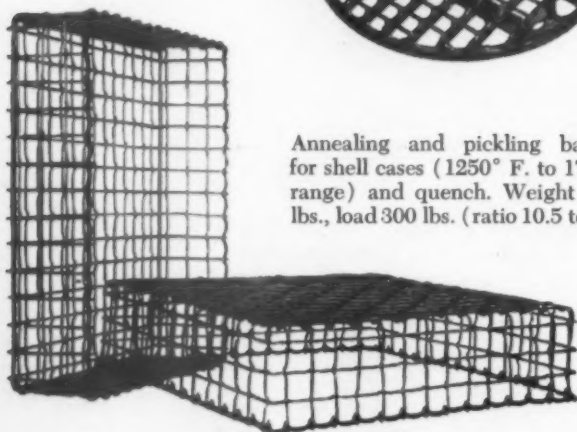


Pit type heat treat basket with grid, weight 120 lbs., load 1200 lbs. (ratio 10 to 1) allows heavier pay loads, reduces unit costs.

Alloy rack for heat treating small calibre barrels (1600° F. and oil quench) 55% lighter than cast fixture. Weight 45 lbs., load 600 lbs. (ratio 13.3 to 1).



Annealing and pickling basket for shell cases (1250° F. to 1700° range) and quench. Weight 27½ lbs., load 300 lbs. (ratio 10.5 to 1).

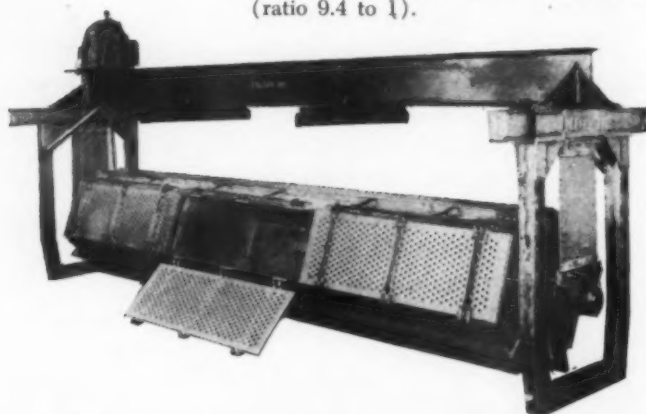


Rolock Engineers work directly with Industrial and Ordnance engineers and officials in creating highly efficient equipment for Heat Treating, Quenching and Pickling metal parts. Rolock fabricated construction saves weight, adds strength, effects economies in motion, time, heat, liquids and abrasion damage. You gain in lower rejects, better processing, speed-up of operations and lowest hour-costs. Recommendations and Catalog on request.

**High Ratio of Load to Weight
Low Service-Hour Costs**



All welded Inconel annealing crate (at 1250° F.), water quench and acid pickle. Weight 425 lbs., load 4000 lbs. (ratio 9.4 to 1).



Monel motorized pickling barrel for processing 4000 lb. loads of cupped steel parts in sulphuric acid pickle. Rotation (10 R.P.M.) minimizes drag out, assures quality work—long life.

Offices in: PHILADELPHIA • CLEVELAND • DETROIT • HOUSTON • INDIANAPOLIS • CHICAGO • ST. LOUIS • LOS ANGELES • MINNEAPOLIS

ROLOCK INC. • 1272 KINGS HIGHWAY, FAIRFIELD, CONN.

JOB-ENGINEERED for better work
Easier Operation, Lower Cost

2RL50

Don't buy a V-Belt Drive unless—

1. the sheave comes in two parts for easy mounting—separately or as one-piece assembly^a

2. the hub and rim are “taper-mated”, for friction cone grip and positive press fit on shaft^b

3. the clamped hub holds shaft position when rim size is changed—no realignment problem^a

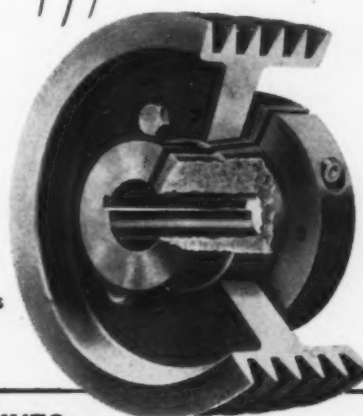
4. I-beam spokes on driven sheave help carry heavier load with less weight^a

5. the belt carries the load with minimum internal friction^c

^a Worthington exclusive

^b Worthington original

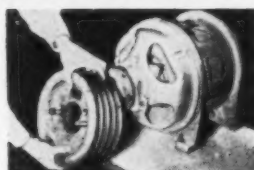
^c Worthington-Goodyear original—endless load-carrying cords in neutral axis



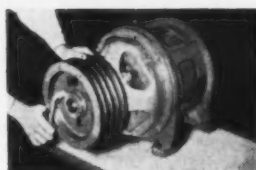
WORTHINGTON MULTI-V-DRIVES



Easy to get on



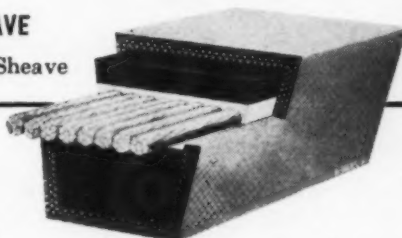
Easy to get off



Yet always tight on the shaft

WORTHINGTON QD SHEAVE

Original Tapered Cone-Grip Sheave



WORTHINGTON-GOODYEAR EC CORD V-BELTS

Each endless cord carries an equal share of the belt load—each belt, matched and uniform in length, carries an equal share of the drive load.

Send coupon for latest Worthington QD Sheave bulletin, V1400B7F

Complete Range of QD Stock Sizes—
Prompt Shipment 853 listed stock sizes in “A”, “B”, “C”, and “D” sections fhp to 600 hp... 332 listed stock sizes of EC Cord V-belts.



It was a crisis that occurs only on Saturday mornings

Minutes before noon on a Saturday morning, a frantic call to Oberjuege Rubber Distributing Co., St. Louis, Mo. reported a motor failure at a brickyard.

A week's stoppage of production was threatened.

A different motor was available, but not the right rpm.

Could Oberjuege furnish belts and sheaves to give the proper speed? Answer (after some quick calculations): yes—two Worthington QD Sheaves, 8 groove, 16 in. driver, 58 in. driven, with a set of 8 Worthington-Goodyear V-Belts.

By mid-afternoon, the brickyard was back in production. Again, a Worthington distributor had saved the day—or, in this case, a week!

WORTHINGTON



ORIGINATORS OF THE QD SHEAVE

WORTHINGTON PUMP AND MACHINERY CORPORATION
MULTI-V-DRIVE SALES DIVISION

Buffalo, N. Y. • General Offices: Harrison, N. J.

POWER TRANSMISSION:
sheaves, V-belts, variable speed drives

PUMPS: centrifugal, power, rotary, steam

AIR COMPRESSORS:
water-cooled, air-cooled

Worthington Pump and Machinery Corp.
Multi-V-Drive Sales Division,
Buffalo, New York

Send Bulletin V1400B7F on Worthington Multi-V-Drives.

Name.....

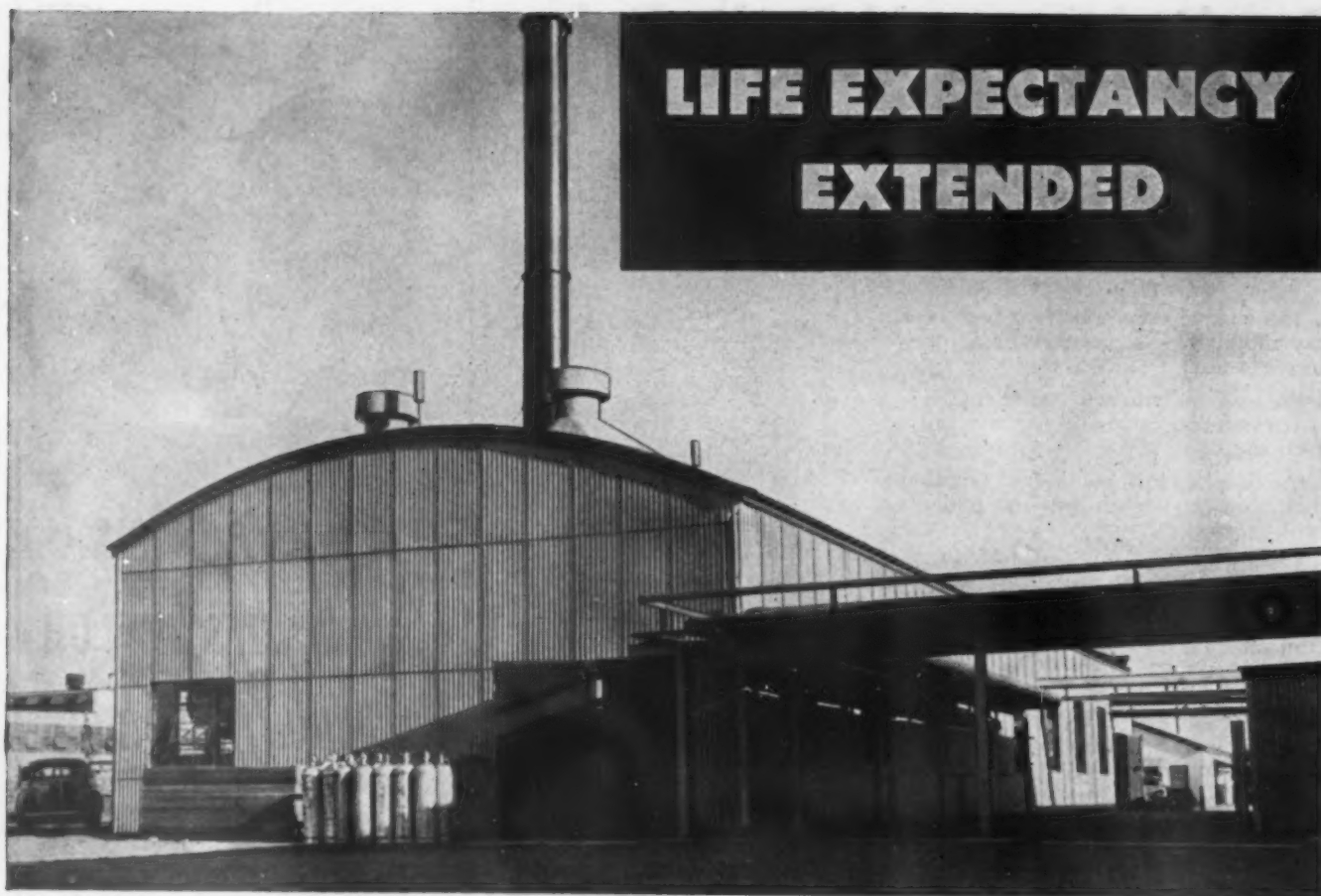
Company.....

Address.....

City.....Zone.....State.....

The Good Right Hand of Industry





**LIFE EXPECTANCY
EXTENDED**

by **K&M "Century"**
ASBESTOS CORRUGATED

Compressor Room of the Birds Eye-Snyder Plant at Walla Walla, Washington, is sided with K&M "Century" Asbestos Corrugated Sheets.

The sturdy "clean build" of these compressor plant walls is one sign they'll live long. They're K&M "Century" Asbestos Corrugated, the material you see on more and more industrial and commercial buildings whose owners have made sure of lasting good looks and economy.

K&M Corrugated saves from the start by simplifying and speeding erection. Cutting, drilling, fitting and anchoring are easily done, with every assurance of trim, durable enclosure. What's more, K&M Asbestos Corrugated Sheets—*stay put*. They don't give in to weather effects and fire hazard, nor to rust, rot, rodents and termites. Thus long-term freedom from maintenance goes right along with the initial economy of using K&M "Century" Asbestos Corrugated for siding and for roofs, too.

Whatever your building plans, see how much this adaptable modern material can save you. Write us for full data and the name of your nearest K&M Distributor.

Even scaffolds and extra labor are eliminated when "TOP-SIDE"* fasteners are used. They are made for use with steel members of any type, on sides and roofs.

* © H. & B. Enterprise Corp.

Nature made Asbestos... Keasbey & Mattison has made it serve mankind since 1873

KEASBEY & MATTISON
COMPANY • AMBLER • PENNSYLVANIA





Ⓐ **PULFUZSWITCH** capacities: 30, 60 and 100 amps, 250 volts AC or DC, 30; and 60 amps, 600 volts AC in 2, 3 and 4 pole.

Ⓐ **KLAMPSWITCHFUZ** capacities: 30 to 600 amps, 250 volts AC or DC; and 30 to 200 amps, 600 volts, AC in 2, 3 and 4 pole types, single or double throw.

Ⓐ **SHUTLBRAK** capacities: 30 to 600 amps, 250 volts AC or DC; and 600 volts AC in 2, 3 and 4 pole types.

For
Efficiency, Safety
and

FASTER DELIVERY

It's

STANDARDIZED Ⓐ **FUSE-TYPE**
FEEDER PANELBOARDS

In times like these, when plant facilities must be expanded or modernized, Standardized Ⓐ FUSE TYPE FEEDER PANELBOARDS, are particularly ideal.

Recently re-designed, inside and out, to minimum space requirements . . . without sacrificing such popular features as generous wiring space and ease of installation . . . these improved, compact feeder panelboards are built of standardized units and assembled, as required for specific application, thus *facilitating deliveries*.

Four standardized widths, ten standardized heights and three standardized depths of boxes meet any requirement. Boxes are shipped from stock . . . with removable ends to permit drilling of conduit openings on the job. Too, panels are readily installed after boxes are in position.

Two dependable Ⓐ Switches . . . the Ⓐ PULFUZSWITCH and the Ⓐ KLAMPSWITCHFUZ . . . make these feeder distribution panelboards the finest in safety and efficiency. Both types combine switch and fuse in one unit so that current is OFF when the door is opened, or the fuse carrier removed. This makes replacement of fuses safe . . . quick . . . simple.

For operating switch requirements, Ⓐ Shutlbrak Type A, Quick Make and Quick Break Interlocking Switches are available in the same standardized construction.

For more information about the standardized Ⓐ Fuse-type Feeder Panelboards, talk it over with your Ⓐ representative (he's listed in Sweet's).



Frank Adam Electric Co.

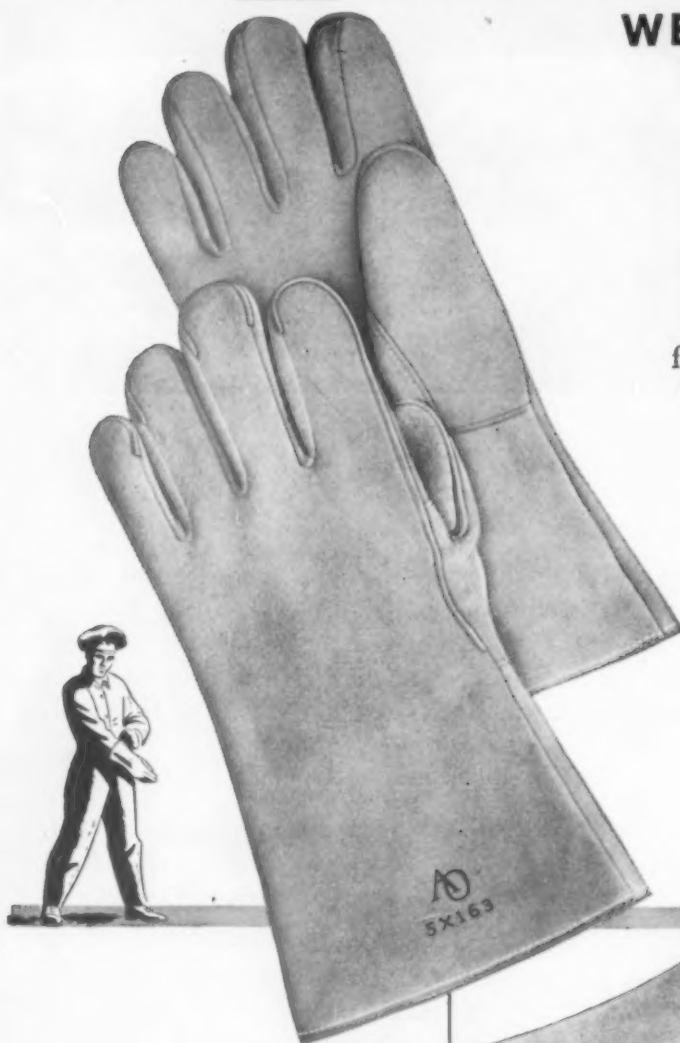
Our 60th Year... ST. LOUIS 13, MISSOURI

Makers of BUSDUCT • PANELBOARDS • SWITCHBOARDS • SERVICE EQUIPMENT • SAFETY SWITCHES • LOAD CENTERS • QUIKHETER

AO Makes the Gloves and Mittens
that both PLEASE and PROTECT
WELDERS

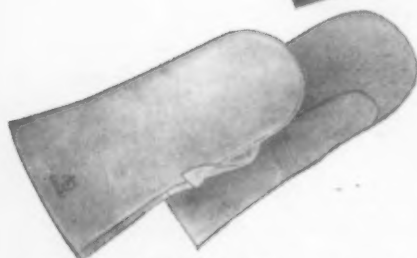
AO
Safety
Gloves
Mittens

Here are four popular leaders from AO's
full line of safety gloves and mittens for welders.
You can't buy more serviceable and comfort-
able hand protection!

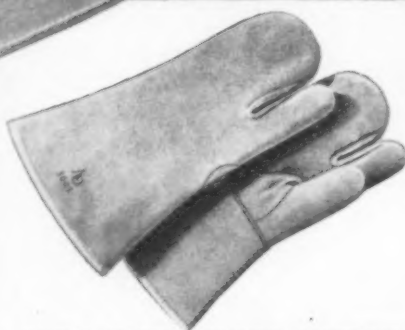


5X163 GLOVE

Long a favorite for gas welding and the
heaviest amperage welding, this glove of
chrome-tanned split horsehide leather
provides exceptional heat resistance with-
out excess bulk. One-piece back and palm.
All vulnerable seams welted for extra
protection. Lining on back of hand is
extra heavy.



6X141 MITTEN Chrome-tanned
cowhide. One-piece back and palm.
Thumb crotch strengthened by
leather strap. The back of the hand
of this highly serviceable 14" glove
is lined. All seams subject to heavy
wear are welted. Companion model
6X142 is identical except that it is
a one-finger mitten.



3003 ONE-FINGER MITTEN

Sleeves tuck into these long, 13-inch
mittens to protect forearms. One-
piece back and palm. Reinforcing
leather strap around thumb crotch.
Back of hand is lined to prevent
chafing. If full mitten is desired,
ask for model No. 3004. Both
models chrome-tanned cowhide.



TX200 GLOVE Newest in the line,
this economical chrome-tanned
cowhide glove is standard length,
gunn style with welted seam at base
of palm and wrist. Lightweight.
One-piece back and wing thumb
give fuller palm, lessen hand fatigue.
An excellent protection "buy"!

American  Optical
SAFETY PRODUCTS DIVISION

Southbridge, Massachusetts • Branches in Principal Cities

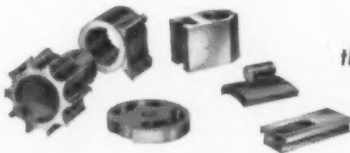


OILITE may relieve your shortage of critical materials

Particularly in mass-production units of small and medium size, Oilite finished machine parts and bearings can be made to your design in a broad range of ferrous and nonferrous metals and alloys, except as limited by government control. Moreover, Oilite products of ferrous base may serve excellently instead of scarce non-

ferrous units or as replacements for steel and castings.

When you employ Oilite you also obtain the benefits of more than 20 years' engineering, research, and production experience in powder metallurgy, together with the service of field engineers throughout the United States and Canada.



You are invited to contact
the field engineer in your district or
write the home office regarding
the application to your needs
of Oilite products.

AMPLEX MANUFACTURING COMPANY
Subsidiary of Chrysler Corporation
DETROIT 31, MICHIGAN

Field Engineers and Supply Depots in Principal U. S. and Canadian Cities

OILITE PRODUCTS

Heavy duty, oil-cushioned, self-lubricating bearings and finished machine parts in ferrous and nonferrous metals and alloys. Permanent filters. Friction units. Self-lubricating cored and bar stock.

A Note to Executives

**Oilite is an effective
replacement, not a
mere substitute**

In the last decade, more and more executives have become "Oilite minded" because the advantages are many. To meet the current situation, many of our customers have changed their specifications to replace strategic copper and tin with products of iron powder or iron powder alloys. Others are replacing iron castings, steel and aluminum with similar Oilite products.

Also of importance to executives, under conditions of urgency, are the wide adaptability, the speed of delivery, and the economy of cost, time and manpower which result from the use of Oilite finished machine parts, made from metal powders.

Intricate designs, which normally require many different machining operations, can be produced quickly and economically from Oilite. There is great freedom of design and frequently two or more parts can be combined in a single Oilite unit. Oilite eliminates up to 24 machining operations.

Delivered ready for assembly, Oilite parts save the time and investment required to tool up by standard methods. It is not unusual to be in production on a complex Oilite part within a few weeks, as compared to a possible 18-month delivery of machine tools. Trained manpower is thus released for other urgent needs.

Oilite is not a substitute. It is metallurgy's answer to the need for a new material. It may solve your problem.

A. J. Langhammer

President

OILITE
PRODUCTS

An oil-resistant Reprone tube, a rubber-insulated, premium high-tensile braided carcass and a resilient yellow safety cover make Champion Air Hose the toughest product of its class anywhere in the world.



"Actual tests conducted in our Iron mine show that Champion Air Hose out-performed all makes of competing hose. We're sold on Republic!"

"Republic Champion Hose is a natural solution to tough problems of air delivery. Don't delay! Let your Republic Distributor give you the full story today. His free, expert recommendations save you money."

Try Republic First...

CHAMPION CALIBRE AIR HOSE

Equip with Republic's Champion All-Service Air Hose and you're set for a good, long period of trouble-free operation.

And that goes for any job no matter how tough!

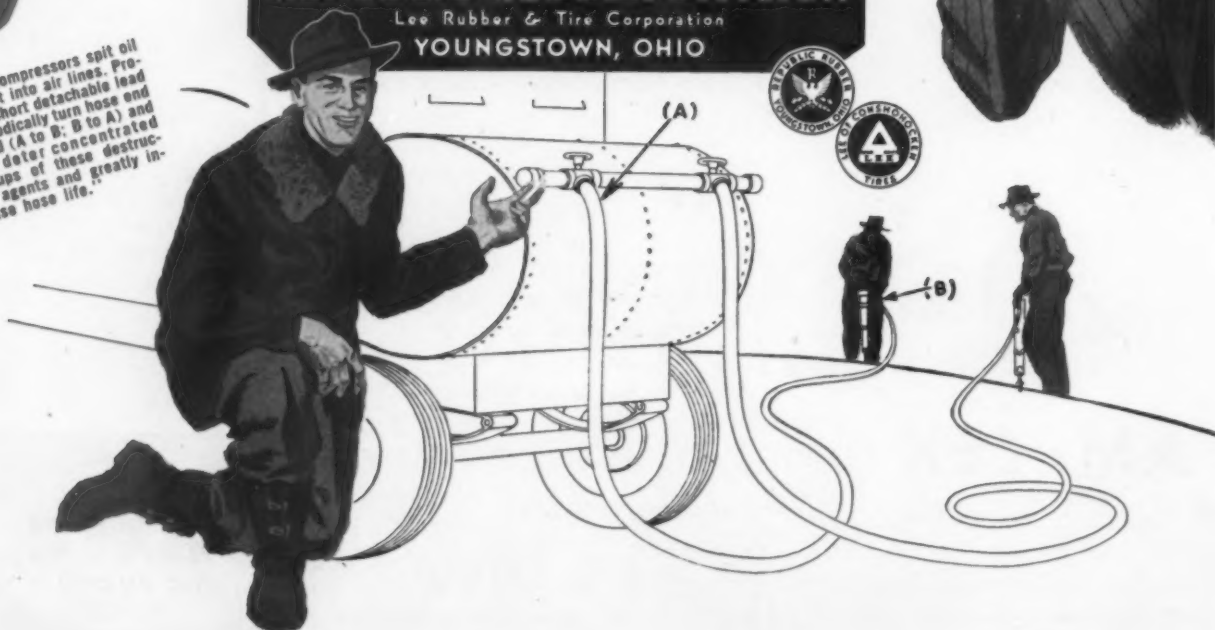
Republic's Champion Air Hose is colored yellow for safer visibility. It's specially fabricated for added strength and flexibility without any increase in over-all hose weight.

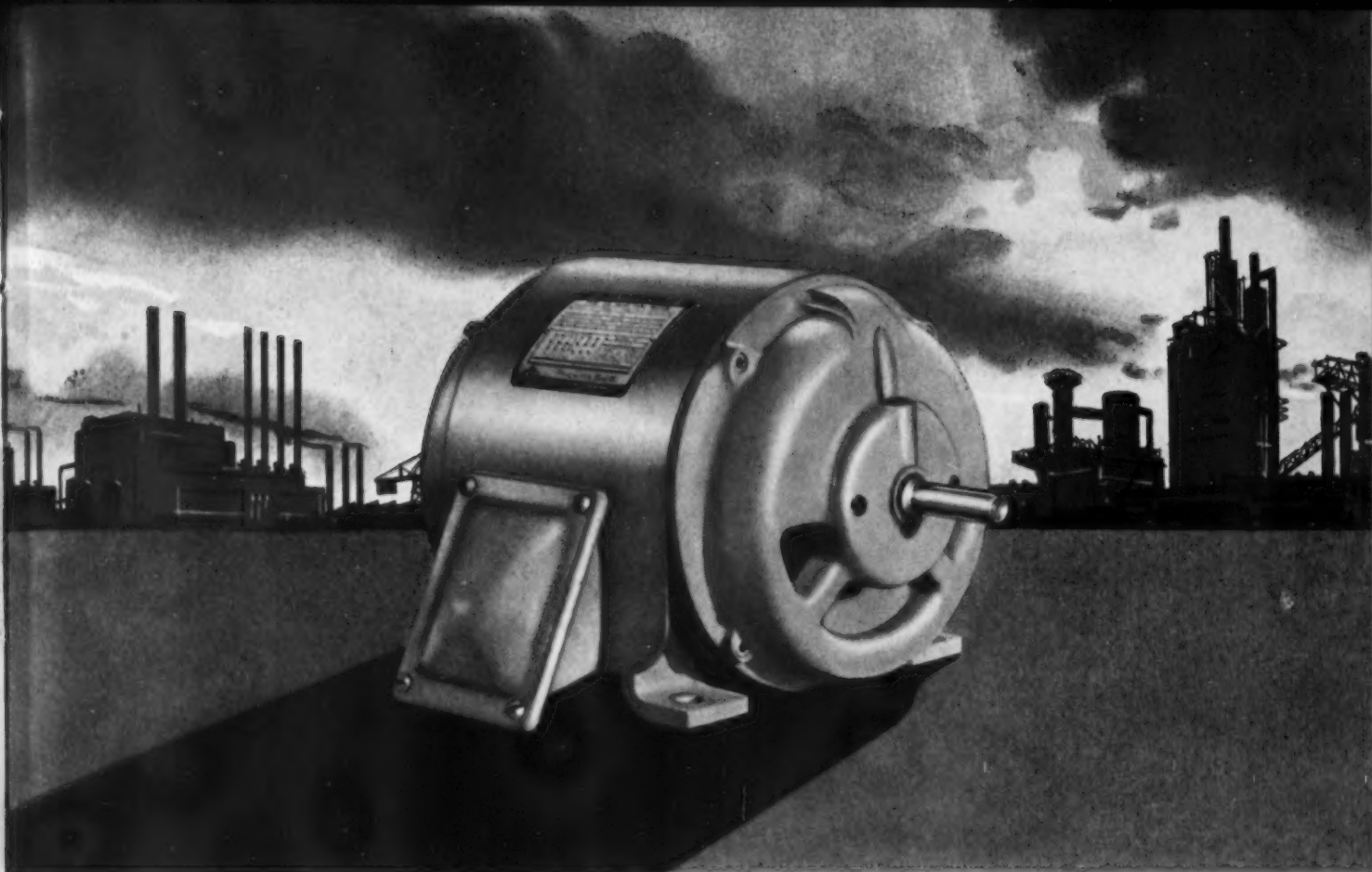
Champion Hose is another great achievement produced by Republic, specialists in industrial rubber products for a half century. Contact your local Republic Distributor or write direct for full facts.

INDUSTRIAL RUBBER PRODUCTS BY REPUBLIC RUBBER DIVISION

Lee Rubber & Tire Corporation
YOUNGSTOWN, OHIO

"Most compressors spit oil and heat into air lines. Provide a short detachable lead and periodically turn hose end for end (A to B; B to A) and you'll deter concentrated buildup of these destructive agents and greatly increase hose life."





Emphatically- **all motors are NOT ALIKE!**

Some time ago, Reliance startled many people by challenging the old chestnut . . . "all motors are pretty much alike". We have since offered proof that all motors are *not* alike by showing how PRECISION-BUILT A-c. Motors are made differently — to deliver dependable power longer. Reliance is always anxious to have interested visitors see our modern plants and the many extra precision steps which account for the big difference in these motors. But if it isn't practical for you to make such a visit, just call in a Reliance Sales Engineer and you will see pictures, charts and hard facts which are turning more and more motor users into Reliance customers.

Sales Representatives in Principal Cities

RELIANCE **ELECTRIC AND ENGINEERING CO.**

1056 IVANHOE ROAD • CLEVELAND 10, OHIO
CANADIAN DIVISION: WELLAND, ONTARIO



MADE BETTER IN MANY WAYS

Read about one on other side

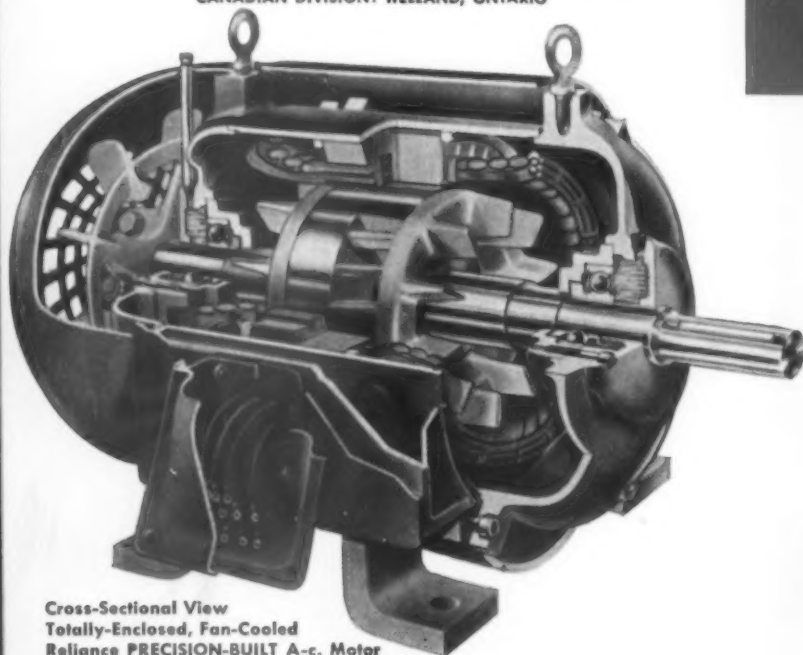


The **BEST** PRE-LUBRICATED BEARING DESIGN in Electric Motors!

The Reliance Pre-Lubricated Bearing Design has all of the features vital to maximum motor life. Its original factory bearing lubrication, for example, provides more operating hours before re-lubrication is necessary than of any other pre-lubricated bearing. Write for *new* Bulletin B-2201 featuring a convenient chart on which you yourself can check the 15 reasons why the Reliance Pre-Lubricated Bearing Design is the best in electric motors.

Sales Representatives in Principal Cities

RELIANCE ELECTRIC AND ENGINEERING CO.
1056 IVANHOE ROAD • CLEVELAND 10, OHIO
CANADIAN DIVISION: WELLAND, ONTARIO



Cross-Sectional View
Totally-Enclosed, Fan-Cooled
Reliance PRECISION-BUILT A-c. Motor



TOTALLY-ENCLOSED, FAN-COOLED A-C. MOTOR
(Inside construction shown in cutaway at lower left)



Protected Open



Splash-Proof



Explosion-Proof, Corrosion-Resisting



General Purpose GearMotor

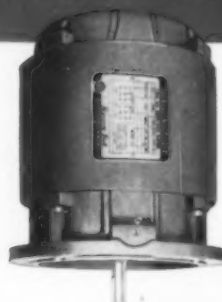
RELIANCE
Precision-Built A-c. Motors

—3/4 to 300 HORSEPOWER—

GIVE DEPENDABLE POWER
LONGER IN EVERY
APPLICATION



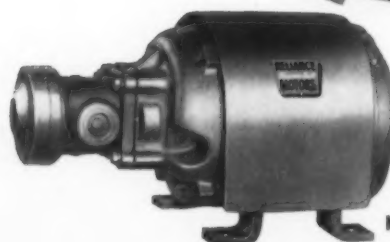
Special Purpose Flange-Mounted Motor



Vertical Motor



"Built-In" Design



Motor with integrally Mounted Pump

Can this clue
to quality be found



Can you find the clue...



...to quality? X marks the spot...



Yes! a PHILLIPS SCREW

It's easy to tell whether a product has been assembled with engineered tightness at vital fastening points. Just look for Phillips Screws. You'll know them by the identifying X formed by the cross-recess on the head of each screw. It's your clue to quality construction on the widest range of products, from television sets to aircraft.

PHILLIPS Cross-Recessed-Head Screws are sold at hardware, automotive and mail supply outlets.

Part of the series of advertisements on Phillips Screws appearing in The Saturday Evening Post.

PHILLIPS SCREWS, with their identifying X formed by the cross recess, are recognized on sight as a mark of quality in well built products. The general public knows that Phillips Cross-Recessed-Head Screws make products stronger, better looking. 14 million readers of *The Saturday Evening Post* are being told that when it comes to assurance of quality, X marks the spot.

These screws cut driving time up to 50%, set up tighter, resist vibration. They are distinctively designed to give maximum strength of head, maximum driver strength. They eliminate driver skids and split screw heads. Whether you use Phillips wood screws, machine screws or tapping screws, you build a better product and you save time, work, money.

PHILLIPS Cross-Recessed-Head SCREWS

X marks the spot... the mark of extra quality

AMERICAN SCREW CO. • THE BLAKE & JOHNSON CO. • CAMCAR SCREW & MFG. CORP.
CENTRAL SCREW CO. • CONTINENTAL SCREW CO. • ELCO TOOL & SCREW CORP.
GREAT LAKES SCREW CORP. • THE H. M. HARPER CO. • NATIONAL LOCK CO. • PARKER-KALON CORP.
PHEOLL MANUFACTURING CO. • ROCKFORD SCREW PRODUCTS CO. • SCOVILL MANUFACTURING CO.
SHAKEPROOF INC. • THE SOUTHWORTHING HOWE MFG. CO. • WALES-BEECH CORP.



THE FASTENERS OF TODAY . . . AND OF THE FUTURE



The sleeper that took the 12 noon plane

Would you have been caught napping in a situation like this?

Suppose you were in the fashion business. You have just created a line of women's nightgowns that are going to be given an unexpected publicity break in some top national magazines. This will mean more sales all over the country. But you must get more merchandise to the

stores in a hurry — or forever lose your golden chance to get sales.

What would *YOU* do?

This happened to one company recently—but the problem caused them to lose no sleep. Faced with this situation at 10:30 A.M. they were able to start goods flowing to the stores on planes that left at noon.

The answer was Air Express!

But you don't have to be in the fashion business to profit from the regular use of Air Express. Here are its unique advantages which any business can enjoy:

IT'S FASTEST—Air Express gives the fastest, most complete door-to-door pick up and delivery service in all cities and principal towns, *at no extra cost.*

IT'S MORE CONVENIENT—One call to Air Express Division of the Railway

Express Agency, arranges everything.

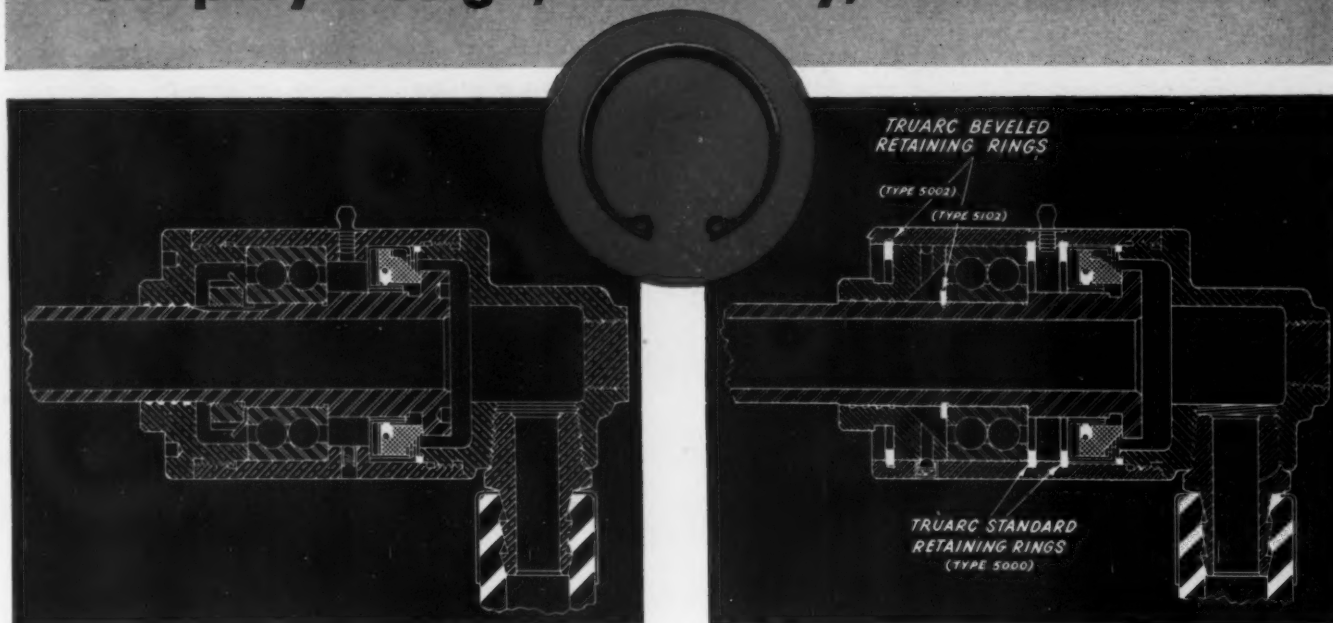
IT'S DEPENDABLE—Air Express provides one-carrier responsibility all the way and gets a *receipt upon delivery.*

IT'S PROFITABLE—Air Express expands profit-making opportunities in distribution and merchandising.

For more facts call Air Express division of Railway Express Agency.



4 Truarc Rings save \$2.41 unit cost, Simplify Design, Assembly, Maintenance



Conventional Way. This design died on the drawing boards, because the Deublin Company, Northbrook, Ill., found the simplified design, using Truarc Rings, superior and more economical.

Truarc Way. Truarc Beveled Retaining Ring holds cap in place, takes up end play, locks entire assembly. Second Beveled Ring positions ball bearing on rotor. 2 standard Truarc Rings position bearing and removable seal, eliminate shoulders, permit manufacture of housing from strong, non-porous, easily machined brass tubing. Unit can be serviced in minutes simply by removing 2 Truarc Rings.

HOW \$2.41 WAS SAVED

Materials saved

decreased wall thickness of housing	\$.79
eliminated bearing lock nut and washer . . . . .	.18
	<u>.97</u>

Machine operations eliminated

Bore, undercut, and tap cap end of housing . . . . .	.39
Locate cap on arbor, and chase threads . . . . .	.28
Drill spanner wrench holes . . . . .	.10
Cut thread on rotor for lock nut . . . . .	.09
Mill slot in thread for tang on lock washer . . . . .	.18
Drill spanner wrench holes in rotor . . . . .	.10
	<u>1.14</u>

Assembly operations eliminated

Install lock washer, tighten lock nut, bend lug . . . . .	.20
Assemble cap into housing . . . . .	.10
	<u>.30</u>

TOTAL SAVINGS . . . \$2.41

THE Deublin Union—a rotating joint for steam, air, or water—is simple, rugged, easy to service. 4 Waldes Truarc Rings hold entire unit together, permit simplified design, cut unit cost \$2.41.

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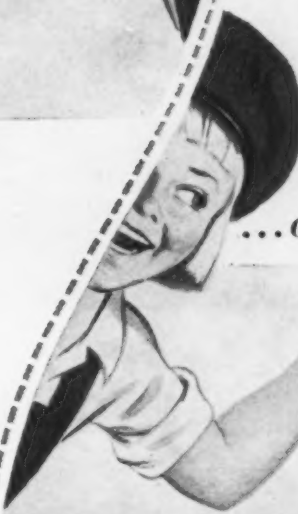
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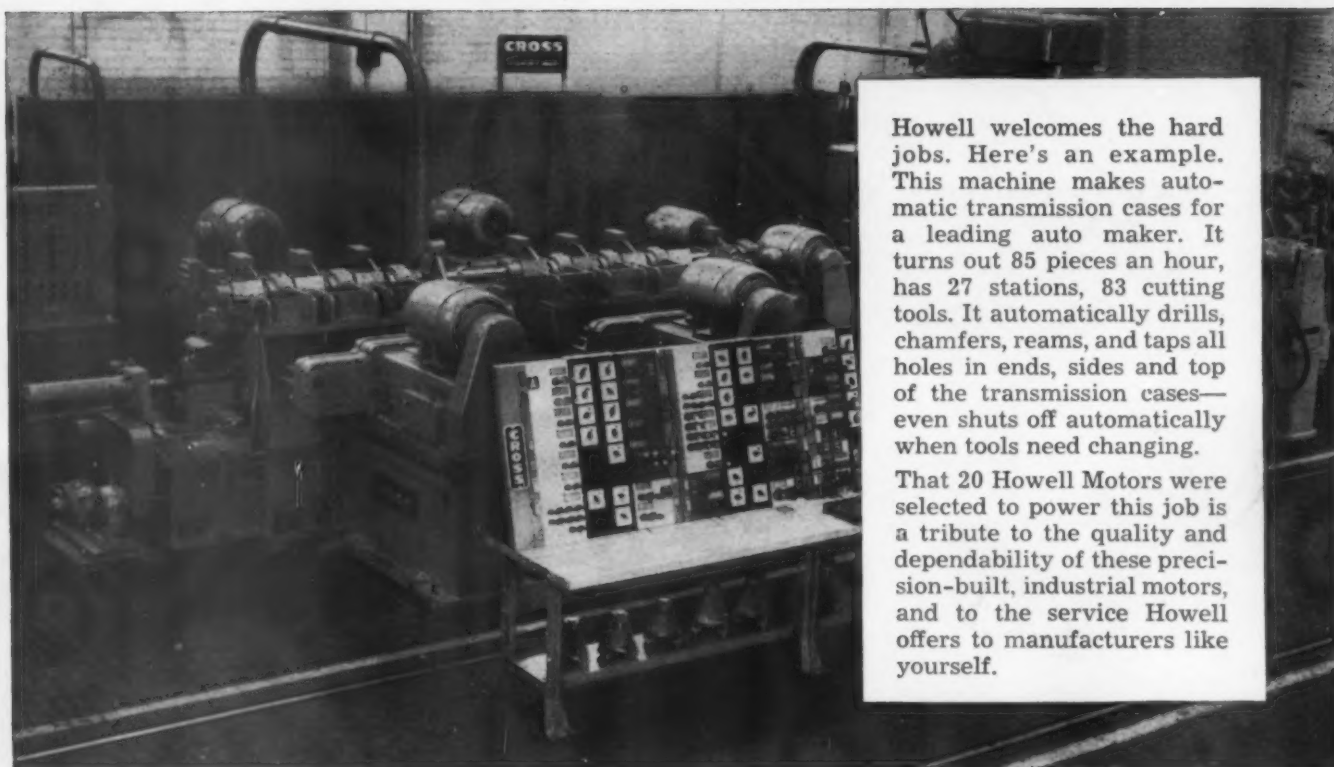
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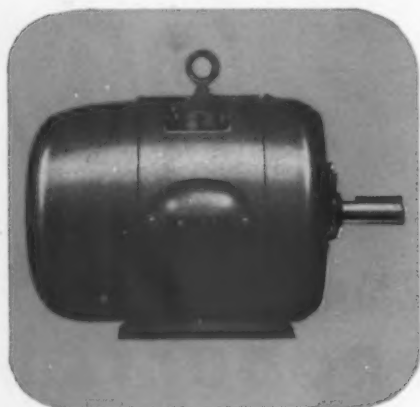
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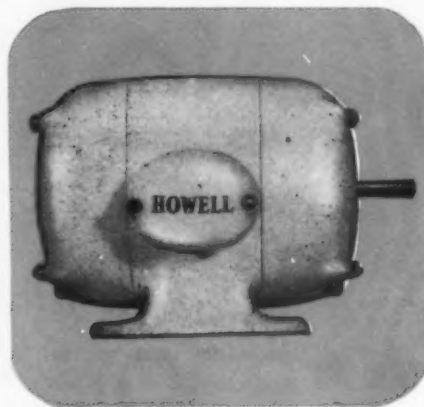
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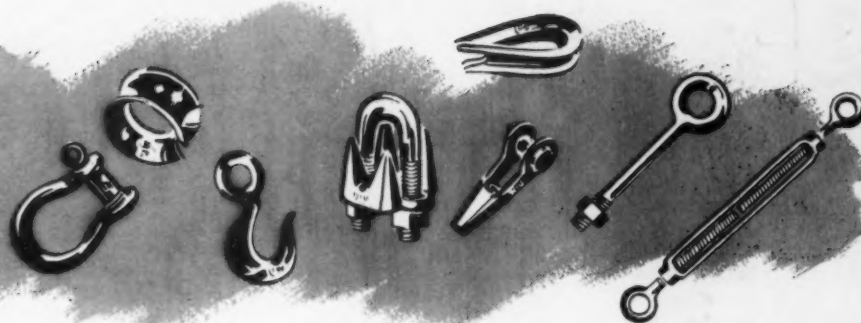
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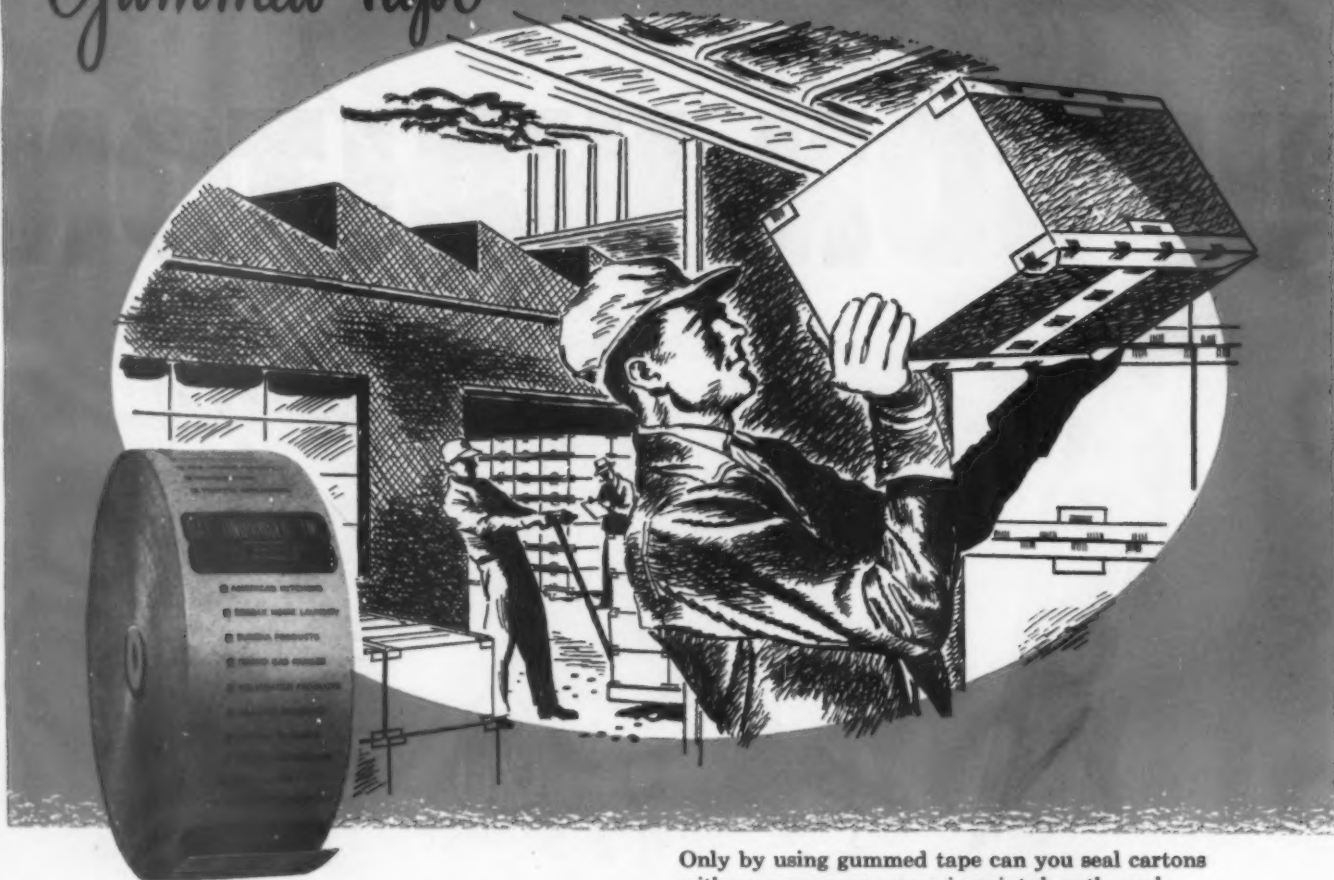
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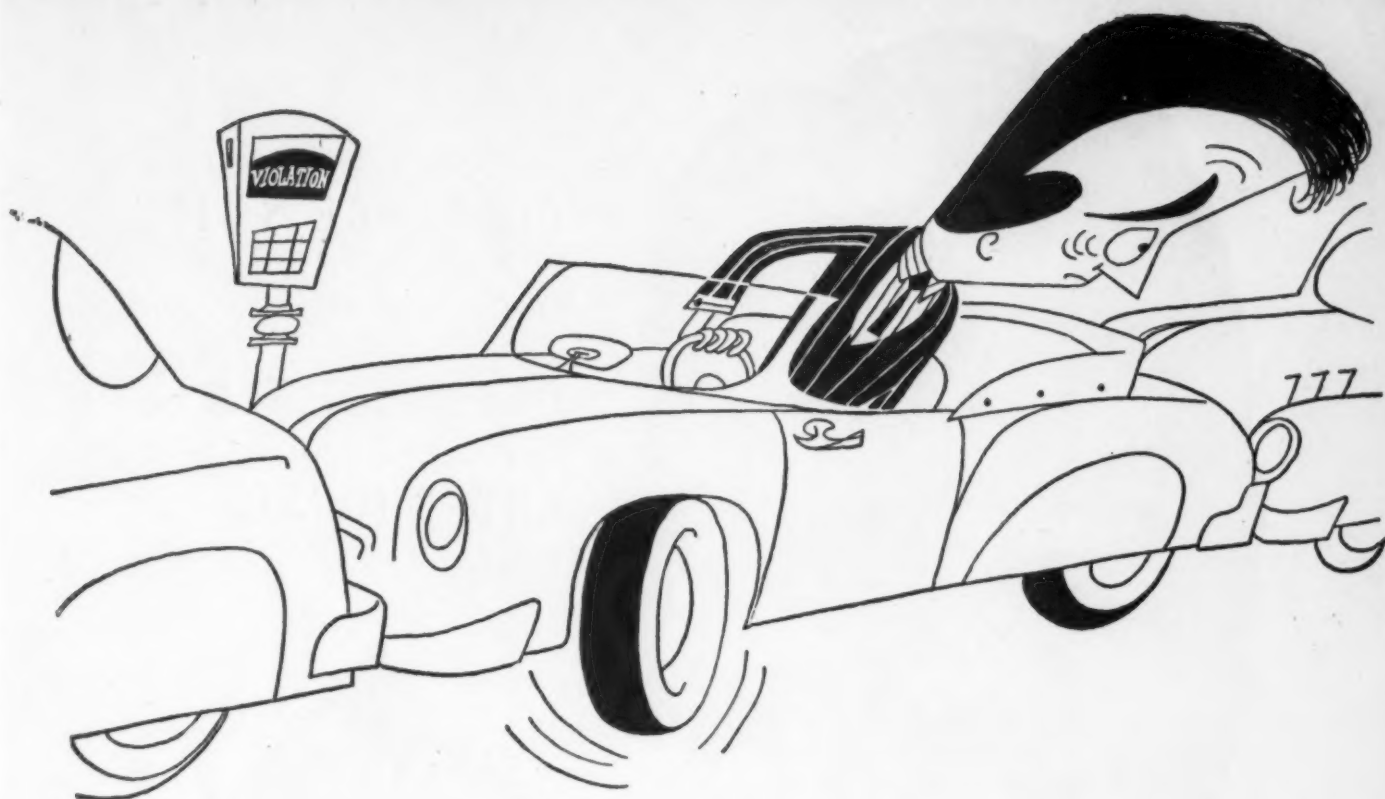
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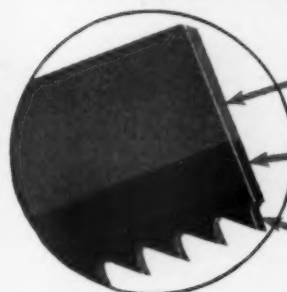


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**with the most uniform
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RUN A TEST! If you haven't already standardized on Norton *New-Process* Wheels in your toolroom, run a comparative test right away. Your nearby Norton distributor or representative will help you select from the several types of Alundum* abrasives the wheels that will cut your costs on any tool grinding job.

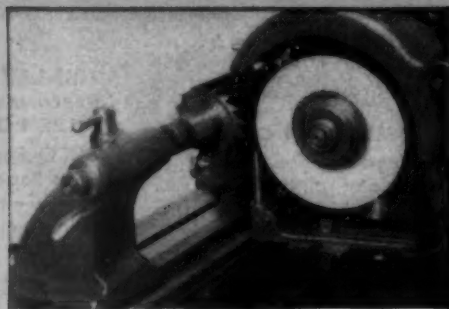
NORTON COMPANY, Worcester 6, Mass.
Warehouses in 5 cities. Distributors in all principal cities.

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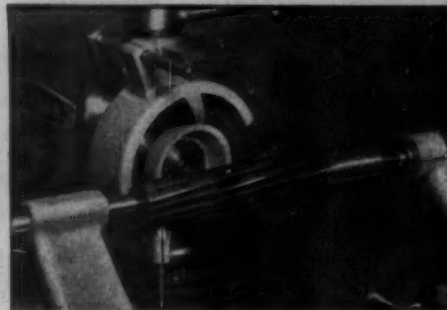


ABRASIVES

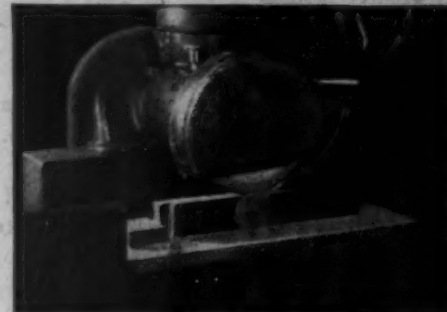
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YOU SAVE TIME sharpening spiral milling cutters with Norton *New-Process* Alundum Wheels because they stay sharp and hold their size much longer than ordinary wheels.

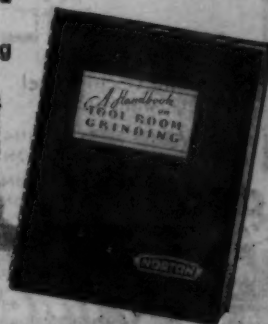


YOU REDUCE SPOILAGE in backing off reamers with Norton *New-Process* Alundum Wheels because their free, cool cutting action does not draw the temper.



YOU GET CHATTER-FREE FINISHES when you use Norton *New-Process* Alundum Wheels on your toolroom surface grinders because their built-in balance makes them run smoother.

YOU GET ALL THE FACTS about lowering toolroom grinding costs in this 162-page handbook on Toolroom Grinding. Write for your free copy of **FORM 835.**





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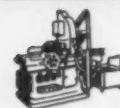
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KEEP TRYING

BETWEEN high demand, scarcities, and regulations, it's getting harder to find and secure materials. For the purchasing agent, who is responsible for procurement, this means just one thing—he must try harder, and keep trying.

Controls, though inherently restrictive in nature, are basically designed to help the purchasing agent whose company stands in greatest need. They do not create additional materials or capacity, but they do serve to channel materials and facilities toward the most essential ends. They do not completely solve the purchasing agent's problems, even in essential industry, but they provide an additional tool for him to use. For the buyer in "non-essential" industry, or on the fringe, they write additional rules into the code of distribution, within which he must operate to the best of his ability.

When we speak of the competitive business system, the term is generally interpreted in terms of competitive selling. But it does not stop there. It means, also, competitive manufacture, competitive technology, and competitive purchasing. In times like these, when production is so directly dependent on what materials can be procured, aggressive competitive purchasing comes close to the top of the list of factors essential to successful operation.

Let us not be deluded at this time by the goal of professional status and dignity, nor lulled by complacent reliance upon the science of purchasing that has been so painstakingly developed over the years. The only practical goal for purchasing today is to get the goods. Explanations and excuses are a poor substitute for a delivery report. Purchasing science and professional skill will help substantially, but the important thing is to dig and to drive. Of course there will be disappointments and discouragement. Can't get materials? Perhaps they are going to the buyer who is trying harder and keeps on trying.

Stuart F. Henrity

TODAY in Chemicals and Plastics

The chemical industry was never busier, as the following late statistics indicate:

Weekly construction awards in chemical processing reported in "Chemical Industries Week" of January 27 totaled \$19,542,000, compared with \$5,412,000 for the preceding week, and \$1,057,000 for the corresponding week in 1950.

Total man-hours worked in selected chemical industries is now at a record peak. In mid-January, it stood at 116, compared with a July 1950 base of 100.

Production of "all chemical products" is up. Latest monthly index stands at 280, compared with 245 a year ago—an increase of 14.3%.

Despite these stepped-up activities, some chemicals will continue to be in critical supply, because of serious shortages in such basic raw materials as . . .

BENZENE (or benzol). Among the "NPA's list of the six most critically scarce strategic materials" according to Modern Industry of January 15. Relief in the immediate future is not too promising, since benzene is primarily a by-product of the coking operation in the steel industry—each ton of coal processed yields only about 2 gallons of benzene.

The supply of benzene regulates the availability of phenol which absorbs 25% of current benzene production, styrene 30%, nylon 12%, synthetic detergents 5%, to mention a few.

Best short-range hope for increased supplies of benzene is the petroleum industry, which plans to up production to 100 million gallons by 1952.

Prompt return of containers by customers daily looms more important to chemical producers. New drums—and especially new carboys—are hard to find. Lack of containers has held up shipments . . . made scheduling of orders a day-to-day scramble. Right now, "empties" are the key to how fast many hard-to-get items flow back to chemical-hungry industries.

When extending a Defense Order rating, don't forget: (1) Indicate quantity applicable to each rating on those DO's carrying more than one rating. (2) The words "Certified under NPA regulation No. 2." This certification must be signed by purchaser. (3) Include a definite shipping date. Such phrases as "immediately, at once, etc." are not valid.

Use of blueprints will swell as defense orders mobilize industry. Mounting errors in reading blueprints will unfortunately take their costly toll. To get clearer prints — contrasting prints with deeper blues, whiter whites — manufacturers, architects and engineers are ordering Mertone pre-coated blueprint paper for printing machines . . . are instructing blueprinting houses to use nothing but Mertone pre-coat.

Mertone: Reg. U. S. Pat. Off.



SERVING INDUSTRY...WHICH SERVES MANKIND

Highlights

This issue's important features summarized for the busy reader



The material **Cost of Armament** and of war is something that every one of us is going to feel for many years to come. If it seemed like a heavy burden in 1941-45, steel yourself for a real shock, for the cost is much higher in today's market for military supplies of every nature.

To begin with, today's equipment is bigger and more complicated, as well as more effective, so it would logically be expected to be more costly. But in addition, Uncle Sam—and that means all of us—must pay the price for the inflation that has taken place in the cost of even such simple items as bullets, shoes, and uniforms. There are some startling statistics in the article on page 70, giving a new slant and added significance to the effects of the economic road we have been traveling over the past few years.

We shall pay that cost, of course. As good purchasing men we must balance the expenditure against what we are getting, not only in the material sense, but in terms of what military preparedness means to us as a nation and as individuals. The American system is **Worth Fighting For**. That is the theme of the article appearing on page 99.

One of America's most valuable assets in the present world situation is our leadership in **Technical Information** and know-how. Protection of that advantage is still a matter of voluntary control, not censorship. But there are some general rules for the guidance of industry to make that control effective. Turn to page 74 for some of the precautions to be observed, and how the government may be able to help your decisions.

Industry's annual bill for maintenance amounts to eight billion dollars, according to reliable estimates. Purchasing agents have a major responsibility in getting maximum value for their part in the spending of **Maintenance Dollars**. There are a score of practical suggestions in the article on page 91, reporting the discussions presented at the recent maintenance conference at Cleveland, where specialists in plant lighting, lubrication, painting, service, cleaning, machine tools and electrical equipment, shared their knowledge and experience on this important subject.



This month's **Guest Editorial** (page 69) is contributed by Matt Shields, N.A.P.A. Vice President for District No. 3. He stresses as a cardinal principle of buying success that the purchasing-sales relationship is essentially a personal, human relationship.

It isn't always possible to put a price tag on a new idea, but one alert purchasing man's suggestion for **Reducing Paperwork** and time with a simplified system and form, was rated by his company as a \$1,000 idea. Look it over, on page 84, and you may rate it as of equal value in your own company's operations.

You may find similar value in the comprehensive analysis of the **Purchasing Job**, as compiled by a prominent purchasing executive in the article on page 114. Here is a broad view of the buyer's responsibility, in respect to the materials that he buys and the policies and procedures under which they are purchased. It provides a sound and convenient check list on many of the factors common to all companies where purchasing is done. How does your department rate?

Tangled Springs can be more than an annoyance when they are unpacked for use on an assembly line—they can be the cause of substantial lost time in production and added cost that **doesn't** show on the purchase order or invoice. This is a problem to be solved jointly by the buyer and the manufacturer. A spring expert tells how the trouble may be minimized or overcome by one of two methods—redesign to avoid tangling, or special packaging techniques that have been evolved specifically for the purpose. If tangle trouble is among your problems, you'll find his suggestions well worth careful study. Turn to page 81.



This month's survey of purchasing opinion deals with the question of **Manpower Problems**—in your own department and in the plants of your supplier industries. Here is a factor that will have increasing impact on every purchasing program as we get farther into the economy of military production. Turn to page 75 for a round-up of experience and opinion.

What does **Top Management** expect of its purchasing men? The interview reported on page 88 brings out the ideas of one progressive executive on this subject of interest and importance to every purchasing man.

Are you making full use of these monthly departmental features compiled especially for the purchasing agent? The **Washington Previews** (page 13) keep you informed on current developments in governmental policy. Another section is devoted to **Office Equipment and Forms** (page 161). Informative **Trade Bulletins and Catalogs** listed on page 19 are yours for the asking. **New Products and Ideas** are also reported (page 130).

RYERSON STEELGRAMS



Swift-changing conditions in today's steel market are so difficult to follow—perhaps these few paragraphs will prove helpful.

Warehouse steel stocks were again recognized as vital to defense by the Government's NPA order which allots a share of "free tonnage" production to steel distributors. The regulation is helpful. However, even at this early stage, Rated Orders and special government programs have substantially reduced total "free tonnage" — reducing the share going to distributors proportionately.

We are doing everything possible to maintain reasonable stocks for warehouse buyers. But, as we see it at the moment, we shall have less steel to distribute among our many customers in the coming months. It will be helpful if you order only for immediate needs and extend D0 ratings whenever possible.

More steel will be available in some specialized cases. Example: Ryerson stocks of aircraft alloys. New program gives Ryerson plants a range of more than 400 sizes, finishes and conditions of aircraft alloy bars and strip. Included are alloys for aircraft parts manufacturers, airframe makers and engine builders conforming to new MIL-S and to AMS specifications. Aircraft quality stainless stocks have also been enlarged.

More on stainless and alloys — Some steel users may not know that the Government is issuing a single set of MIL (Military) specifications to replace the different U. S. Army, Navy, Air Force, Air Force-Navy, and Federal specifications previously in effect. The new specifications for a few products have yet to be published, but Ryerson alloy and stainless stocks assure a warehouse source for all the important MIL "specs" now in effect and, as additional products are covered, Ryerson stocks will be immediately brought into line.

Ryerson tubing stocks, not affected quite as much as some products by the tight steel market, are being enlarged to include Rockrite tubing (with close I. D. tolerance and better I. D. finish for hydraulic cylinder applications) and pressure tubing to JIC "specs". Fairly adequate stocks of both are in prospect. This is in addition to seamless and welded mechanical tubing, extra heavy wall hot rolled tubing, structural tubing.

Changes on the nation's railroads are not confined to rolling stock, in railway shops alloy chain is finding increased acceptance as a replacement for wrought iron slings. Reasons are easy to find. The alloy chain packs three times the tensile strength of wrought iron. Lasts 5 to 15 times longer. Taylor Made Alloy chain, available from Ryerson, costs little or no more than wrought iron. It is widely used for overhead lifting in most all industries. Other types of chain also available for prompt shipment.

Wire rope, especially desirable where chain may cause damage, is currently available in a wide range of types and sizes. Shipment from Ryerson is prompt.

Availability of high tin content babbitt metal is threatened by the short tin supply. Not affected — Ryerson production of Glyco babbitt metal. Made by a special process, it has physical properties equal to those of high-tin babbitt, costs considerably less, and remains in good supply.

Indications are that metal fabricators contemplating purchase of machinery and tools should make an early decision on placing orders. Ryerson can still make fairly prompt shipment on many types, but demand is strong and delivery schedules are lengthening. All but lighter tools are currently offered on the basis of 5 to 8 months.

JOSEPH T. RYERSON & SON, INC. STEEL-SERVICE PLANTS: NEW YORK • BOSTON • PHILADELPHIA • DETROIT • CINCINNATI
CLEVELAND • PITTSBURGH • BUFFALO • CHICAGO • MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISCO • 1-15-51

Purchasing is a Personal Job

● By Matt Shields

PERSONAL contact and friendship is most important in all business relationships. Good purchasing agents make it a point to earn the good will and confidence of their suppliers.

Nothing is more effective in forging good will than travel and seeing the other fellow at work, meeting his associates and extending to them a cordial invitation to visit your people should their travels ever bring them to your city. Knowing the other fellow and the company he represents goes hand in hand with a full understanding of his ability to serve you.

Changing conditions will impose heavier responsibilities upon each and every one of us. These personal relationships will become more than ever important. One of our problems will be the training of new personnel, and this is one of the points to emphasize in our training.

There is more to good purchasing than seeking a source and a low price. Potential savings are always present in the distribution of materials from the receiving platform through stores to production lines, as well as through your reclamation channels. Also, a constant watch must be kept on specifications if we are to make use of newer materials from our great research laboratories.



Matt Shields is General Purchasing Agent of the Gustin-Bacon Manufacturing Company, Kansas City, and Vice President of the National Association of Purchasing Agents for District No. 3.

He has been closely identified with purchasing and with the transportation industry throughout a long business career. A native of Omaha, Nebraska, he got an early start in purchasing with the Supply and Procurement Department of the Union Pacific Railroad in the Omaha office, advancing to the position of Buyer. He stayed with UP twenty years with time out for two years of overseas service with the U. S. Army Transportation Corps in World War I. In 1929 he came to his present position, directing the purchasing activities for one of the leading fabricators and distributors of railroad equipment.

Mr. Shields joined the Purchasing Agents Association of Kansas City in 1934, and has been an active participant and leader in many phases of its work. From the start, he has also been a regular attendant at the National conventions. He was elected President of the Kansas City group in 1947-1948, and National Director the following year. Among the committees on which he has served effectively are: National Affairs, Public Relations, Commodity Discussion, and Education.

As District Vice President, his interest and abilities are enlisted in the National program. On the N.A.P.A. Executive Committee he represents the Central Iowa, Chicago, Denver, Kansas City, Milwaukee, Rock River Valley, St. Louis, Tri-City, Twin City, and Twin Ports Associations.

A friendly man who likes people and gets along well with them, Matt Shields' life is filled with activity. He has a well-earned reputation for being always busy, whether at work in his office, out among his suppliers and associates, or pursuing leisure-time activities such as golf, gardening, and fishing. He is married and has three daughters.

Buying Inflated Bullets

Inflated costs and more complex requirements have fantastically increased the cost of arming for defense or for war

By A. N. Wecksler

LARGE scale military purchasing is both the cause and the major victim of inflation. Current costs of military requirements are so much higher than during World War II that the spread seems almost unreal.

However, while these higher costs are due in part to the toll that inflation has taken, that is not the whole story. In addition to the higher prices, costs have advanced because military equipment has become larger, heavier, and more complex.

The cost of the B-17 bomber—the Flying Fortress which made its mark as one of the best heavy bombers of World War II—is not really comparable to the cost of the current B-36, or the B-50, or the jet B-47, all of which are drastically different from the heavy bomber of World War II. The present-day bombers are more complex, require more equipment, have a greater speed, can fly at higher altitudes, and with much greater range.

This means more pressurized equipment, more electronic controls—and obviously much higher costs. The B-17 at the end of 1945 cost something under \$300,000, while the giant B-36 runs around \$3,500,000, and the jet B-47 costs somewhat less than \$3,000,000.



Cost of clothing issue to an individual soldier in World War II was \$122. By June, 1950, this had more than tripled. Further price advances since then have brought the cost up to \$400.

But the increased prices on items which have not changed materially since World War II present the most startling contrasts.

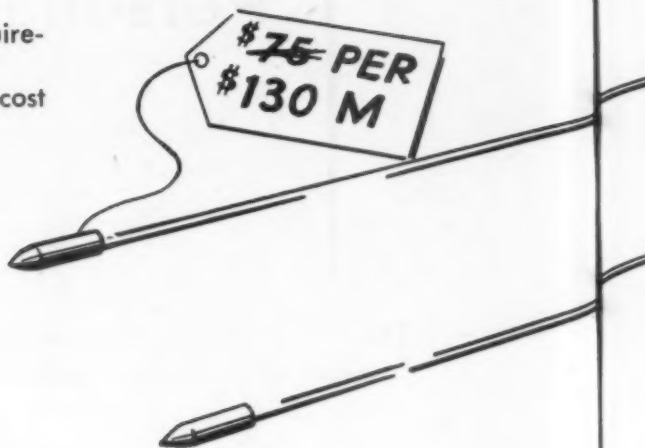
The tactical jeep during World War II cost \$1,100—the current cost is about \$2,700. During World

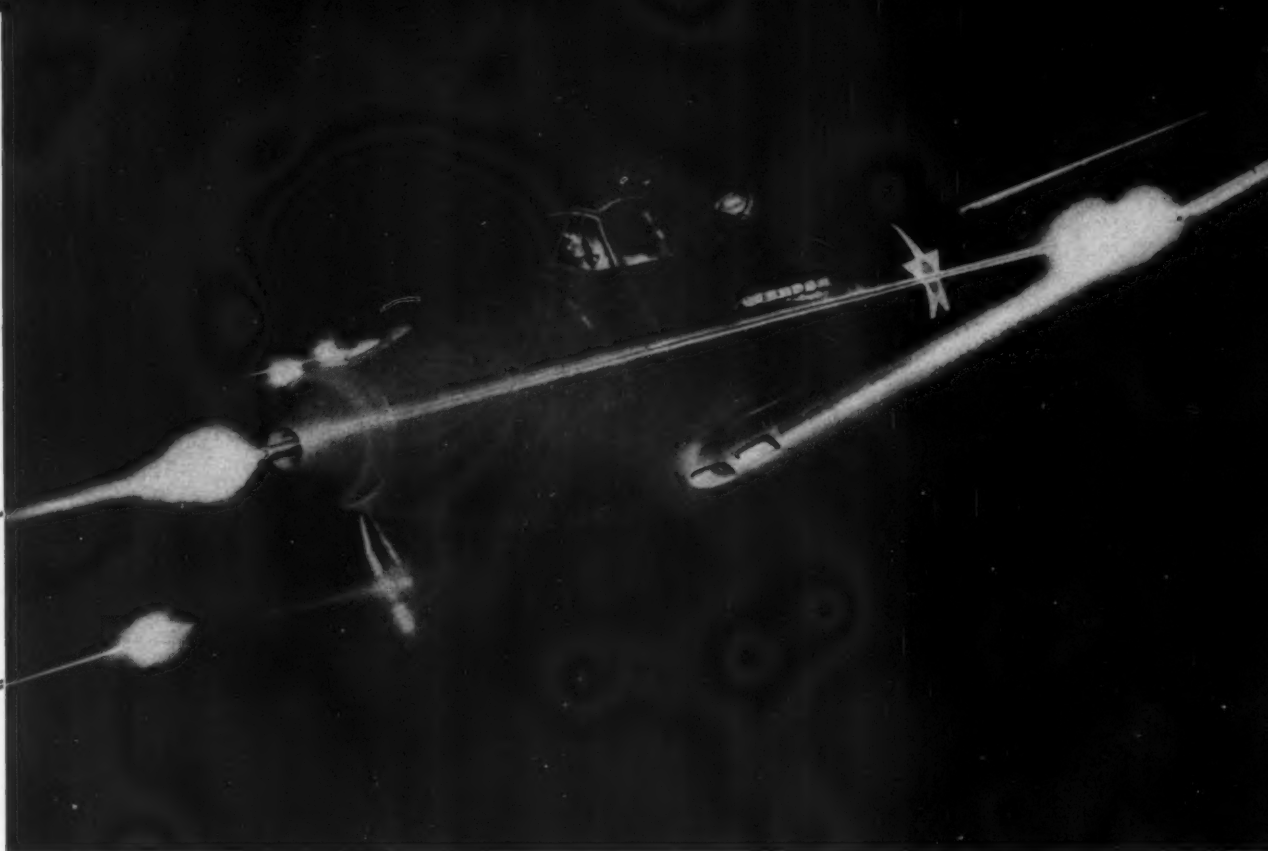
War II, the medium tank cost somewhat under \$100,000—now it costs about \$230,000. The newer tank is more effective, better armed and better controlled, but essentially it is the same tank. A light tank during World War II cost between \$40,000 and \$45,000, and now the cost is \$90,000.

These tank prices are after tooling costs have been written off, and obviously if tooling were added, the costs would be increased materially. However, neither the World War II prices nor the current prices take tooling costs into account, and therefore are quoted on a comparable basis.

While the costs of military equipment have been creeping up ever since the end of World War II, there have been two very steep climbs in the upward trend of prices. The first occurred after OPA was abandoned, when the whole price pattern showed a sharp increase. The second sharp hike occurred after Korea.

Some indication as to what has occurred in these price cycles is the cost of equipping an infantry division during 1944, when \$14,000,000 was sufficient. As of last June, this sum had been boosted to \$75,000,000, and now will run somewhere





ZOOMING PRICES OF RAW MATERIALS IN DOMESTIC AND WORLD MARKETS RAISE COSTS OF REARMAMENT

	Nov. 1941	May 1942		June 1950		Nov. 1950	
	Prewar	5 Months War Impact	Percentage Change	Postwar Pre-Korea	Percentage Change	5 Months War Impact	Percentage Change
Rubber (pound)	.225	.225	...	.286	+27.1%	.781	+173%
Tin (pound)	.520	.520	...	.767	+47.5%	1.351	+ 76%
Burlap (yard)	.115	.110	-4.35%	.164	+49.1%	.315	+ 92%
Wool (pound)	1.16	1.22	+5.17%	1.725	+41.4%	2.50	+ 45%

Similar price trend comparisons could be shown on a wide range of essential materials, both domestic and imported. These four representative examples have been selected because of the added factor of interest that they are all bought from nations that are either receiving aid from the United States or are threatened by Communist aggression in the Far East.

around \$100,000,000. In this case, the comparison is not entirely realistic since, according to Army reports, the firepower of an infantry division has been increased 50% since World War II, and the division has been increased in strength by 33%.

Increases in costs of equipping an armored division are most startling. During World War II, an armored division cost roughly \$30,000,000.

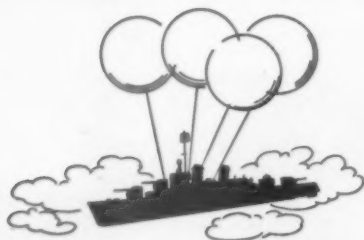
Price tag on a medium tank, World War II model, was under \$100,000. The current model, in the current market, costs \$230,000.



MILITARY PROCUREMENT PRICES before and after the attack on Korea

Selected items from Progress Reports and Statistics,
Office of Secretary of Defense, December 4, 1950

	April 1950	Oct.-Nov. 1950	Percentage Increase
ARMY ITEMS			
Bailey bridges (each)	37,796.00	51,792.00	37.0%
Bearing bushing (each)	.79	1.38	74.7%
Burlap sack, 57 x 50, (each)	.417	.756	81.3%
Cable, 3-conductor (foot)	.0355	.063	77.7%
Combat service boots (pair)	5.72	8.148	42.4%
Cotton shorts, white (pair)	.4233	.555	31.1%
Drafting set #8 (each)	68.50	95.00	38.7%
Eggs, shell (dozen)	.3746	.5715	52.6%
Gasket set (each)	.0849	.12757	50.3%
Milk, frozen (quart)	.1357	.1909	40.9%
Radio set AN/PRC-10 (each)	263.88	382.50	45.0%
Soap powder, hand (pound)	.09	.1235	37.2%
Steel wool (pound)	.218	.3407	56.3%
Tire, 7.50 x 20 (each)	23.99	33.18	38.3%
NAVY ITEMS			
Actuator (each)	.28	.70	150.0%
Carburetor (each)	2.64	4.40	66.7%
Crane T/A-8121 (each)	244.00	426.00	74.6%
Crane, crawler, 1½ cu. yd.	32,855.00	46,345.00	41.1%
Crane, truck mounted, 15 ton	16,000.00	24,500.00	53.1%
Differential shaft 4-B2007	36.41	58.02	59.4%
Dry battery BA-37 (each)	.1575	.33	109.5%
Enamel, semi-gloss (gal.)	1.68	2.75	63.7%
Grease fitting kits (each)	6.40	21.80	240.6%
Oscilloscope OS-8/U (each)	139.00	219.00	57.6%
Screw, forearm (each)	.15	.38	153.3%
Smoke shell M313 (each)	23.89	37.22	55.8%
Space heater (each)	38.00	53.00	39.5%
Timing lights (each)	2.42	3.87	59.9%
Wire rope, 9/16" (foot)	.119	.238	100.0%
AIR FORCE ITEMS			
Carbon removal compound (gal.)	1.07	1.50	40.2%
Height finder AN/TPS-10D	35,880.00	49,822.00	38.9%
Inspection light A-5 (each)	3.20	4.75	48.4%
Jacket, flying type (each)	16.50	25.00	51.5%
Parachute T-7A (each)	198.30	300.77	51.7%
Parachute, cargo, G-11 (each)	1,287.00	1,798.66	39.8%
Protective helmet (each)	20.20	26.84	32.9%
Shirt, wool, flying (each)	7.84	10.00	27.6%
Suit, nylon, flying (each)	9.47	14.00	47.8%
Sun glasses (pair)	2.29	3.00	31.0%



In June, 1945, the Navy purchased a 2,200 ton destroyer for \$7,600,000. In June, 1950, estimated cost on a 3,650 ton destroyer was \$40,000,000, and went substantially higher in the second half of the year.

As of last June, the cost increased to \$200,000,000, and now will run upward to \$250,000,000.

The cost of equipping an individual soldier shows more amazing contrasts. In 1939, clothing and individual equipment issued to a soldier cost \$122. As of last June, this cost had advanced to \$380, and now is pushing \$400.

All branches of the military services have been hard hit by the inflationary price trend. Some indication of the impact of price increases on the Navy is evidenced by the increased cost of ships.

In June 1945, the Navy purchased a 2,100- to 2,200-ton destroyer for \$7,600,000. Last June, a 3,650-ton destroyer was estimated to cost \$40,000,000, and the cost now would be substantially higher.

Small Items Also Costly

The increase has been just as drastic on small items. During November 1942, 30-caliber tracer bullets cost \$75 a thousand—the present-day tracer bullet is \$130 a thousand.

Textile price increases are highlighted by the cost of a pair of olive drab wool trousers. In November 1942 they cost \$5.75. Last June such a pair of trousers cost \$10.03, and the cost today is considerably higher.

The major problem entailed in the inflated prices is that the armed services cannot get delivery of the equipment they need based on their prepared budget. This means that either they come in for additional funds, or they do not get the equipment.

During a period of defense mobilization, there is every disposition to give the military what they ask for—so that military appropriations



Today's more effective equipment is also bigger, heavier, more complex, and a lot more expensive. The B-17 Flying Fortress (middle plane in photo) at \$300,000 in 1945, was acclaimed as one of the best heavy bombers of World War II. Now we are using the giant B-36, at \$3,500,000, or more than ten times the former cost. (Left to right in photo: B-36, B-29, B-17, B-26, and F-51.)



become a cyclic race with rising prices. As the military budgets are increased, the higher appropriations in effect feed the growing inflation.

If at some point the rising prices are not effectively stabilized, then there is danger of cracking both the civilian and the military economy.

Currently the outlook is for an increased volume of military purchasing. The basic question is whether the inflationary pressures created by mobilization can be siphoned off by taxes and credit controls, and curbed through mass purchase of Government bonds and tight enforcement of price ceilings.

The various strains on military budgets caused by the price pressures have made the military services increasingly price conscious—although during past periods in history, the military approach has been to disregard, in large measure, the impact of military mobilization on the civilian economy.

Index Important to the Military

Before the day of mechanized warfare, the armies drained manpower from the civilian side of the economy, but they did not take a substantial portion of civilian production. In early warfare, the armies were not as dependent upon civilian production as they are now.

Result is that price trends today are as important an index to the military as they are to industrial purchasing agents.

Just as it is true that the final curb on purchase price to a purchasing agent is the ultimate consumer's ability and willingness to pay for the final product—similarly the military can only pay for its equipment in sums which the Congress will appropriate, and which the taxpayer will ultimately finance.

Obviously, the Congress and the taxpayer offer little resistance to paying for military protection in a time of national emergency. But inflation can make military expenditures excessively costly, and can sap a nation's ability and will to fight—which is practically the same, in effect, as though the taxpayer were to refuse to pay the bill.

MILITARY PROCUREMENT PRICE TRENDS

Excerpt from Progress Reports and Statistics,
Office of Secretary of Defense, December 5, 1950

Due to the existence of fixed price contracts for many items, the rise in basic commodity prices was not fully and immediately reflected in procurement prices paid by the armed services. However, the increase in general price level is being felt more and more by the armed services. With the exception of meats, the price of which has dropped seasonally during the past two months, and a few other scattered items, higher prices are being encountered in an ever-increasing number of items. These price rises are becoming increasingly widespread despite efforts to reduce costs wherever feasible by simplification of specifications and substitution of materials. The recent steel industry wage and price increases will undoubtedly lead to further increases in the prices of many military procurement items.

One of the key commodities affected by the Korean conflict has been aviation gasoline. Preliminary screening of offers for delivery of aviation gasoline starting in January 1951 indicates the following price increases per gallon for normal production:

	1 July 1950 Average	Nov. 1950 Average Quota- tion for Jan. 1951 Delivery	Percent Increase
Grade 115/145 Avgas			
U. S. Gulf	\$.1675	\$.1725	3.0%
West Coast	.1565	.1775	13.4%
Grade 100/130 Avgas			
U. S. Gulf	.155	.16	3.2%
West Coast	.144	.165	14.6%

However, normal production is not adequate to meet current armed services' needs for aviation gasoline. Consequently, part of the aviation gasoline supplies of the armed services are being derived from marginal production, utilizing materials, plant facilities and transportation practices that are not economical under normal conditions. As a result, premiums of varying amounts are being paid for the supply increments furnished from marginal sources, ranging from 5 to 45%, depending upon the particular circumstances involved.

Guard Technical Information

OUR Government is fully aware of the dilemma presented by any limitation, even though voluntary, on the flow of information among private citizens. Free exchange of information contributes to rapid progress in science and industry.

On the other hand, all major powers depend on published data for a great share of their strategic intelligence. The present state of emergency, therefore, has directed attention to the security implications of imprudent release of technical information.

The Nation's interests can and should be served by voluntary protection of strategic technical information by private individuals and organizations. The program of voluntary protection is directed toward technical information which, if disclosed, would weaken the total position of the United States more than strengthen it.

What Information Is Affected?

The program of voluntary protection is not primarily concerned with information which is "classified" as restricted, confidential, secret, or top secret, by the United States Government. Unauthorized disclosure of such information is forbidden under penalty of law. If there is any question as to whether certain information is "classified", specific advice can be obtained by writing to the Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C.

The program is primarily concerned with unclassified technical information and commercial and industrial information of a technological nature. Information falling within the scope of the program includes unclassified technical data on:

- Advanced industrial developments.
- Production "know-how" and technology.
- Strategic equipment.

Special installations.

Circumstances under which voluntary protection is invited are somewhat broader than indicated by this listing. The public itself, through inquiries which already have been made of various Federal agencies, has showed its awareness of the dangers of divulging certain information. Those inquiries illustrate certain categories of information regarding which the advice of the Government can prudently be sought. For example:

Collection of Data Which Individually Might Have Little Significance

A major railroad was asked to provide minutely detailed information on the physical layout of the system and an analysis of the flow over its lines. The stated purpose of the inquiry was to construct large maps of that and other rail systems. The railroad questioned whether the inquiry should be answered inasmuch as such a *set* of maps might constitute strategic intelligence of greatest importance.

A major oil company wanted advice on whether to publish a booklet showing the location of its storage facilities throughout the world.

Information Requested Under Unusual Circumstances

A supplier of ordnance received a questionnaire from a broker with respect to his facilities for performing Government contracts. The questionnaire appeared unnecessarily detailed for its stated purpose.

A city official received numerous requests from unknown persons for detailed information concerning fire, police, and water department operations. He felt that such information in the wrong hands would be contrary to the national interest.

Little-Known Technical Data

A maker of electronics equipment asked whether a proposed radio

broadcast on technical aspects of his products would be a security violation. The data involved were not secret, but represented *advanced* technical information that was as yet of limited general knowledge.

Scope of Distribution

Inquiries may also be made as to the extent of release which may be desirable. For instance:

- Should the information be given only limited distribution?
- Should part of it be distributed if part is withheld?
- What distribution could be considered prudent?

How to Get Advice

The Office of Technical Services was designated by the Secretary of Commerce to serve as a clearing house in the program of voluntary protection of technical information because of its experience in publishing technological information developed in Government agencies or obtained from other countries.

In conducting this service, OTS will refer inquiries to one or more interested agencies or departments expert in the particular field, assemble the comments, and forward the Government's advice together with any original materials submitted by inquirers. It is then entirely up to you whether or not you act on the Government's advice regarding the disclosure of unclassified information. There is no compulsion for you to do so, since the program is entirely a voluntary one. Each individual possessing knowledge or information is the final judge of how best to serve the public interest.

It will not be possible to provide instantaneous service, but all inquiries will be answered promptly within the limitations imposed by problems of fact and judgment.

Nothing in the program is meant to stop industrialists and others who

(Please turn to page 336)

Have MANPOWER PROBLEMS Affected Purchasing?

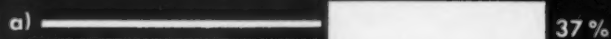
The inevitable disruption in our economy brought on by rearmament has brought many problems. Where to get skilled manpower for industries making war goods, and how to prevent widespread unemployment in strictly civilian industries is one of the most important. Shortages of and restrictions on vital materials affect production, and therefore employment, in both cases. We asked purchasing agents, who are responsible for obtaining the materials to keep production lines operating, for their views on the manpower situation and its probable future course.

① Is your company facing a manpower problem now ?



② If so, is it a problem of

a) Possible unemployment caused by materials shortages and resultant production cutbacks, or ?



b) Inability to obtain sufficient skilled employees to handle increased production due to defense orders



③ Have similar difficulties among your suppliers caused any disruption in the flow of materials and components you buy ?



④ If your company has been forced to cut back production is it laying off workers or maintaining its labor force by means of a shorter work week ?



⑤ Do you believe the present situation calls for compulsory draft of manpower to insure that an adequate supply of skilled workers can be maintained where most needed ?

YES ☐ 16 %
NO ☐ 84 %

⑥ Do you think the present "wage stabilization" policy of the Government will be effective in preventing a heavy flow of manpower from peace time jobs to "war jobs" ?

YES ☐ 13 %
NO ☐ 87 %

⑦ In your opinion, is a manpower shortage imminent in respect to qualified purchasing personnel ?

YES ☐ 48 %
NO ☐ 52 %

WHAT THEY SAY

"The wage stabilization policy should possibly be combined with a job freeze to prevent loss of skilled employees leaving for other jobs where higher wages are offered."

"Manpower shortages and material shortages are cited by many suppliers as the reason for delayed deliveries. We have met this situation by ordering further ahead of our date of requirements."

"Manpower problems will become greater by the end of 1951 if the present situation continues to exist or if it becomes worse."

"Curtailing export of vital materials and proper distribution of our domestic materials would be the best help for purchasing."

"Clarification of governmental regulations, with straightforward 'earthy' explanation of 'high brass' reasoning could point the way to solution by industry of many of its problems, and the best course for the

future overall good of the nation."

"Government purchasing men find higher pay in other lines of endeavor. Government low rate of pay for him and his staff, and cuts in his personnel appropriation, create too great a burden." (Government P.A.)

"Several large firms are advertising for employees and are offering such inducements as special bonuses for production, swimming pools, clubs, cheap hot lunches, beautiful rest rooms, etc., premium pay for second and third shifts, free insurance and hospitalization, and elaborate pension plans. These costs will be added to war contracts on a cost plus basis which the Government (we, the taxpayers) will have to absorb."

"A large percentage of our help are women so we wouldn't be as hard hit as the other lines of industry. During the last war we were forced to cut out the third shift, and if inductions increase, we may be forced to do that again."

How Much Purchasing Responsibility Should Be Delegated to Local Units?

By **C. T. Hardwick** College of Commerce and Finance, University of Detroit

MOST progressive concerns are well aware of the advantages of centralized purchasing over departmental buying within a single company or one composed of a few branches. Accordingly, today, purchasing has taken its place as a specialized function along with production, sales, finance, and industrial relations.

Notwithstanding, in the case of many multi-plant concerns, where the company has expanded in volume and size, with operating divisions or plants more or less widely

distributed, certain inherent limitations or weaknesses in complete centralized purchasing have been realized. Some modification in the degree of centralization may be considered necessary. For today's management, the practical question is not "to centralize or not to centralize?" Rather, it is likely to be: "How much purchasing activity should be delegated to branches or local units?"

Too often, this question is answered according to personal, unsupported preference of executives, or the established organizational

philosophy of management, or the individual qualifications and personalities of present purchasing personnel, or merely the traditional, "inherited" condition or habit of company operation.

There are better criteria. The aim of this article is to assist in resolving the management decision by examining selected criteria by which to test the desirable degree of centralized purchasing. These "check points" are applicable to various kinds of companies, regardless of their legal type of ownership or financial control.

I. Geographic Area Involved

IN this discussion, the geographic consideration is limited to the supply side of the market—the area within which a company operates and from which it buys products and services; this excludes the sales market for the company's own products. Two very important sub-points are pertinent to the area consideration, namely: transportation and communication. These will be examined as part of the area discussion.

Take a simple illustrative case. A manufacturer of toys, employing a few hundred workers, has two plants located in cities about 25 miles apart. Management has to decide in these questions:

Should all buying be centralized in one plant?

Should each plant purchase separately some or all items?

Should follow-up, inspection, and stores also be centralized or decentralized?

Let us suppose that both toy plants produce like articles and have common needs for manufacturing, maintenance, and office use. It is

reasonable to surmise that the two plants located within 25 miles of each other will of necessity purchase from common or similar markets, and probably from identical vendors. Communication and transportation can not be noted as obstacles to central purchasing. The telephone, telegraph, and messenger services will be efficient for any such short distance. Common carrier transportation, as well as company-owned trucks, can provide expeditious transportation services at reasonable cost. Centralization of purchasing and allied functions seems to be a logical sequence (subject to other criteria yet to be examined).

Now, if one of the units were situated 300 miles from the other, instead of 25 miles, the decision might be reconsidered. Increasing the geographic separation interposes some obstructions to effectiveness of complete centralization of purchasing. Communication may still be adequate by telephone and telegraph and over-night mail service, but is secured at increased cost.

Transportation services may or

may not be satisfactory for the longer distance. If the locations were, for example, the Chicago and Detroit areas, daily or frequent expedited traffic movements could usually be effected. However, if one plant were located off of a major traffic lane, the transportation available might be weekly only. Transportation costs for a 300-mile haul might offset in part or whole the savings of consolidated central purchasing of some items. Cross-hauling and other transportation wastes and delays may occur.

Again, the 300-mile separation of the two plants will likely mean that many different sources of supply, bidding a variety of prices, could be appropriately utilized if local buying were encouraged. Consequently, the decision as to the degree of centralized purchasing will tend to be modified. Consideration should be given to permitting some local buying authority.

This factor of geographical separation can be carried on to a case in which the units are removed beyond 1000 miles from each other.

Everything observed for the case of 300 miles still applies, with magnification. Since the "face to face" relationship of the two branches has been almost entirely removed by the 1000-mile distance, the purchasing authority will tend to be delegated to local units, but may be subject to central office review and direction. Sometimes, with widely dispersed plants, divisional areas are estab-

lished (e.g., an Eastern Division, Great Lakes Division, and Pacific Division). Rather than complete national central purchasing, there may be arranged regional plans of buying under national coordination.

Conclusions: The degree of centralized purchasing desirable bears an inverse relationship to the extent of the area. The greater the area concerned, the less tendency there

will be to retain all purchasing activities in one central location. Within reasonably restricted areas, centralized purchasing will tend to be more effective. The extent of area that can be efficiently served by central purchasing is contingent on the efficacy of communication and transportation services. The better grade of these services available, the larger will be geographic area that central purchasing can serve.

II. Number, Size, and Kind of Plants Served

THE number of plants that can be efficiently served by a single centralized purchasing division cannot be stated axiomatically. Nevertheless, the "span of control" principle should be considered. Two, three, or even six plants might be satisfactorily handled, but when the number reaches 25 or 50 plants, coordinated services will be extremely difficult to secure.

Number of plants is not the sole deciding factor, because each plant may vary individually as to number of employees as well as variations in material, equipment and supply

needs. Whenever a plant becomes large enough to require a group of local procurement specialists, the advantage of centralized purchasing is lessened.

Another pertinent consideration is the type or kind of operations. Consider first, the case of ten branches each making different products. There may be little if any reason to insist on central purchasing. By contrast, ten plants may all be producing comparable articles requiring identical raw materials and accessories, so that centralization of purchasing operations will

assist productivity as well as insuring many savings. Other circumstances may concern a combination of these two cases, so that some degree of centralized buying would be essential for efficiency, but with provision for permissible local action to fit the differences in plant size and requirements.

Conclusions: The greater the number of plants concerned, the larger the individual plants are, and the greater the dissimilarity of material needs of the various plants, the greater degree of decentralization seems to be in order.

III. Nature of Products

DO the various manufacturing units produce the same product (e.g., rubber tires), or do the separate units produce a variety of products (e.g., tires, footwear, mechanical rubber goods, etc.)? General observations can be chanced upon the "line" being produced. The more homogeneous the end products are, the more common the procurement needs tend to be; consequently, the more these wants can be standardized in basic contracts. On the other hand, if a line of completely dissimilar articles are produced by the various units, standardization becomes more difficult and sometimes even impractical.

Take another approach to the specifications aspect. If the individual units of a firm are assembling a complex mechanical article, many various technical parts will have to be procured. To insure a uniform end-product conforming to allowable tolerances, and to assure a minimum of waste and spoilage by separate units, central standard specifications at least are in order and probably central procurement is also essential. By contrast, if the manufacturing units are assembling a simple non-technical item, using

common materials that are available almost anywhere at comparable prices, the proposal for centralized purchasing weakens and perhaps evaporates.

Or, consider manufacturing units producing articles composed of one or a few basic raw materials such as lumber, steel, or cotton. For obvious reasons of economy in quantity purchases as well as expertness demanded, these cases are suitable for organizing according to a centralized buying plan. The opposite condition exists when the separate production units are making articles consisting of ubiquitous materials, as, for example, a soft drink manufacturer utilizing water as the basic ingredient.

Another type of situation occurs if a national concern has been formed by accumulating under one management a diversity of production units having little or no resemblance to each other in respect to end-products. This being so, the material needs tend to be unrelated, so that individual purchasing organizations will usually be a part of the program of individualized operations. To illustrate, the parent company might include, among many

units, one making rubber rafts, and one making automobile carburetors. The basic production and procurement wants are so distinctly different that centralization of purchasing can accomplish little and may cause undesirable interference.

Another differentiation is whether the finished article is made up of perishable or non-perishable matter. As a broad generalization, centralized purchasing prevails for durables, but tends to be inappropriate for perishable items in proportion to the amount of subsequent handling and shipping necessitated.

One further observation concerns the question: Are the products mass production items made according to advance scheduling, or are the articles custom made for individual demands? It seems more reasonable to install centralized purchasing for multi-plant firms where common mass production items are made. But when custom made articles are being produced, local buying authority will tend to be more suitable to satisfy individualized orders.

Conclusions: The greater the similarity of products and processes, the greater degree of centralized purchasing is to be preferred.

IV. Type of Market and Price Structure

THE markets in which purchases are effected can be classified as "local" or "national". If the materials being purchased are marketed under national trade or brand names (e.g., paint), the selling price will tend to conform to standard pricing, with few deviations. Purchasing from national markets through centralized purchasing should provide advantageous negotiation of large scale contracts as compared to separate local, small scale purchases. Other common articles or services may be produced and sold solely in the local markets, so that over the country a wide range in prices may exist (e.g., printing and binding jobs). In the latter situation, decentralization of purchasing to the individual local plants may permit taking advantage of favorable local conditions.

Markets can also be differentiated as "organized" or "unorganized". In the organized markets, such as automobiles, prices are company administered and predetermined, resulting in almost uniform national prices (differing perhaps by the amount of transportation costs to

buyer's destination). In an unorganized market, a contrasting situation usually occurs, in which independent contractors may bid in a reasonably wide range of prices for the same job. With a multi-plant organization, the purchasing program should be flexible enough to take advantage of both the organized and unorganized markets.

Another significant market characteristic to be analyzed is the extent of price competition. Most experienced buyers can fairly accurately judge markets in which they are active, as being highly competitive, having good competition, or little or no competition. Dealing with a variety of competitive conditions demands expert purchasing knowledge. Central purchasing organizations tend to be better informed regarding competitive ramifications and opportunities, therefore can more efficiently negotiate from wider markets, especially when the local units are encouraged to secure supplemental bids from neighboring vendors.

Territorial specialization also affects decisions to be made regarding

preferred markets. Certain products like tobacco, cotton, machine tools, furniture, paper, will be found concentrated geographically because of climate, know-how, etc. Central purchasing organizations will ordinarily be better informed and more disposed to transact purchases outside of a local sphere, and extend solicitation of bids from the special national markets. If local purchasing units tend to restrict bids to local markets while central purchasing includes all markets, the best buying by the local purchasing group will be merely a fortuitous event.

On the other hand, it must be acknowledged that some items such as sand, gravel, and clay are available from almost all markets, with little saving to be secured through central buying, since hauling and transportation costs are a large item if materials are moved very far.

Conclusions: No fixed rule can be applied to the effect of market considerations, but sober review of all the attributes of particular markets is imperative before a prudent decision on centralization can be made.

V. Time Required to Process Purchase Orders

ONE of the common indictments of centralized purchasing pertains to the "excessive" time consumed between date of requisitioning and the issuance of the purchase order. This red tape of central purchasing procedures need not be excessive. With the right leadership and administration in purchasing, it can be reduced to a reasonable minimum; a simplified but adequate system can be devised and installed to fit local and central circumstances to the satisfaction of all.

It is a fundamental rule that the

time required to process an order must be carefully related to production schedules, and delivery secured as demanded. Elapsed time may be available from records, or computed from original papers, or estimated on the basis of samples studied.

In connection with the "processing time" factor, the feasibility of storing or warehousing supply needs should be checked. If adequate and economical storage facilities are available and applicable, the lag in processing an order may be incon-

sequential under a planned stock level system. The possibility of central negotiation of basic contracts against which various units can issue local "call orders" for direct delivery, should also be explored.

Conclusions: Centralized purchasing should be effective as long as processing time conforms to production and operation needs. Exemptions from central purchasing should be permitted when processing time exceeds or obstructs specific operating requirements.

VI. Dollar Value of Purchase

THIS consideration concerns both the unit value of purchase and the accumulative value for specific items purchased repetitively over a reasonable period of time.

Some purchases do involve small dollar value. There are many so-called "nuisance" purchases where the dollar value of the purchase is

not worth the time and effort to process. However, as the value of the individual item increases, it becomes more significant and more substantial savings can be secured through consolidated and planned central purchasing.

Also to be considered is the frequency of the purchase. A single

buying action such as a special repair part of low dollar value (e.g., a rubber feeder roller for an office machine) has little reason for routing through central purchasing. The opposite would be true in the case of repetitive requirements of raw materials or operating supplies, that add up to substantial dollar value over

the year; such purchasing is well adapted to central contracting.

Conclusions: The degree of cen-

tralized purchasing should be related to the unit and accumulative dollar value of purchase. The smal-

ler the dollar value involved, the less central purchasing seems appropriate for efficiency.

VII. Cost of Handling the Order

THE average purchasing expense incurred in processing a purchase order is easily computed by dividing the annual operating cost of the purchasing department by the number of orders issued. No standard dollar cost figure can be stated. The wide variations reported by different companies in handling costs may, among other reasons, be explained by variations in cost accounting factors or by differences in the responsibilities and scope of individual purchasing divisions. Extremely low cost per order may indicate that many of the normal purchasing tasks are being performed by other divisions outside of purchasing.

However, the average unit cost

of processing a purchase order, as computed for a given company, can be used as a partial guide as to what orders can be efficiently handled by central purchasing. For example, purchase orders for an item priced at 40 cents should not ordinarily be processed through a central purchasing division in which each order involves a processing cost of two dollars.

For low value purchases, some special procedure such as petty cash or personal vouchers can be installed to avoid the disproportionate cost of central handling. Based on company experience, some rule can be evolved so that purchases equal to—or perhaps even up to two times the average cost of order handling

—would be processed under a simplified and more economical scheme than central purchasing.

Utilization of company warehousing can also help avoid excessive handling cost on small orders. On a selective basis of items, the storage cost can be controlled so as to be lower than the individual buying cost. In addition, standardization and reduction in varieties of purchases can be gained, and many of the "nuisance" orders of small unit value can be eliminated.

Conclusions: Dollar value of each purchase order should not be equalled or exceeded by the cost of central handling, either by direct purchase or issuance from company stockrooms.

Applying Results of the Study

It will probably be accepted without argument that arbitrary rules can never take the place of sound business judgment. The criteria suggested in this discussion are not offered as infallible precepts, but rather as benchmarks to assist management in measuring and determining the appropriate degree of centralized purchasing in the light of known factors or circumstances of company operation.

Efficiency in management and operations depends on the organization and procedures established pursuant to findings of facts, and not based merely on beliefs or opinions. True business leaders not only do what has to be done; they are ever searching for facts to determine what ought to be done for better performance. *Progressive purchasing management* of multi-plant organizations, while recognizing the merits and advantages of centralization, will retain only the best aspects of a central purchasing system when desirable changes are substantiated by factual information.

A few additional comments are in order. With few exceptions, central management responsibility will not be logically delegated for deciding over-all purchasing policies such as competitive bidding requirements and reciprocity agreements. In like manner, other broad mana-

gerial duties will be retained in the central purchasing office, such as prescribing *performance standards and operating rules* of procedures for all branches of the parent company. Again, central purchasing responsibility is retained for preparation of *important specifications and negotiation of major contracts*.

In general, then, these check points are intended to assist management in deciding the amount and extent of local buying, follow-up and inspection to be delegated by central purchasing under certain circumstances for a multi-plant organization. Notwithstanding the numerous suggestions in the foregoing discussion pointing to the desirability of delegated authority, *centralized purchasing has without any serious doubt substantially earned and proven its place as the purchasing norm*. This survey is presented as a guide to management decision concerning *departures from the norm*. Nothing said here has been intended to encourage the "fragmentation" of purchasing activities by returning buying to the individual operating units, as was the case in the early years of the century. Rather, the offered choice for multi-plant companies lies between the assigning of the purchasing function to central procurement specialists or partial delega-

tion to local plant purchasing departments.

In the present complex business economy, proposals are too often over-simplified, such as offering only two alternatives as a solution for an intricate problem. Thus, rather than complete centralized purchasing or complete decentralized purchasing, a saner approach may be to consider a combination of both plans.

Central suggestion, direction and coordination will be preferred under given circumstances, rather than central purchasing performance. Central determination of company purchasing policies and procedures may be the assurance of reasonable standards for local performance. Such decentralized buying under central control and coordination may be the efficient method when the decision to delegate responsibilities is based on facts.

It is well appreciated that other less tangible factors will bear influence for individual companies. Better tests or criteria may be developed for specific concerns. It is hoped, however, that the traditional methods of organizing purchasing, under individual managements' business philosophy "for or against centralization," will be supplemented and aided by a survey of the factors suggested in this review.

Are TANGLED SPRINGS Adding to Your Cost?

By W. Russell Hilles, Methods Engineer, Hunter Spring Company, Lansdale, Pa.

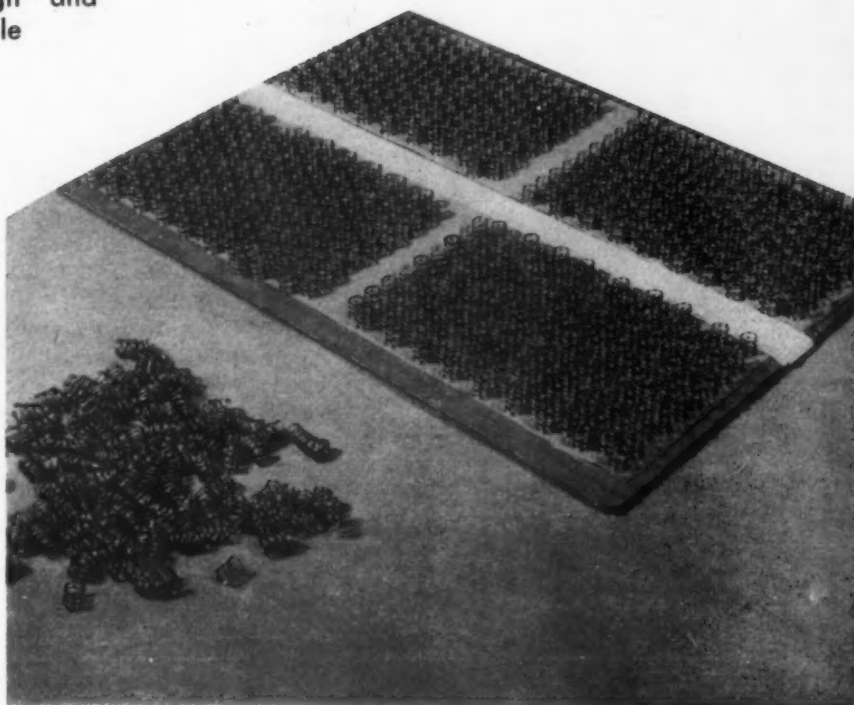
- Special attention to design and packing may eliminate trouble

TANGLING of springs and spring components during shipment is a materials handling problem shared by the spring manufacturer and the industrial user. Severity of tangling depends both on the spring design and the number of springs packed together. Comparatively high-cost springs that are ordered and packed in small quantities usually do not tangle easily, or they can be untangled with little loss of time. In applications where low-cost springs are unpacked and mounted on a mass-production line, however, tangling can mean a serious slowdown and high manufacturing costs.

Not all springs tangle. Most of the commonly specified types can be packed, shipped, and unpacked without difficulty. Severe tangling and difficult untangling are most liable to occur in:

1. Extension springs, compression springs, and wire forms with *open hooks or ends*.
2. Compression springs in which the *separation of coils* is larger than the wire diameter.
3. Compression springs, torsion springs, and wire rings with *high spring indexes*.

There are two ways to prevent



Small compression springs having a tendency to tangle can be packed for shipment and convenient use by spotting them individually in rows on an adhesive sheet.

spring tangling—redesign of the spring, or special mounting and packing. Whenever permitted by the application, it is most satisfactory to redesign the spring to reduce its tendency to tangle. Special mounting and packing simply reduces contact between springs.

These assemblies add to cost; they may cost more than the springs themselves, as in the case of low-cost springs in large lots. Before making a decision, the purchaser should compare the relative cost of special packing as against untangling springs with ordinary packing.

Redesign to Reduce Tangling

There are two questions that must be considered in evaluating a particular tangling problem in order to determine where and how much

redesign can help:

How badly do the springs tangle (one large mass of tangled springs or bunches of two or three)?

If tangling does occur, how easy is it to untangle the springs?

The redesign procedures suggested here are chiefly concerned



Tangling trouble is stopped before it starts, by mounting these extension springs with open extended hooks on adhesive strips.

with compression and extension springs. However, they indicate the treatments used for most other types of springs and spring components as well.

Close spring ends. The multiple occurrence of end tangling in a large lot of springs is easily avoided by closing the spring ends. Because spring ends are closed automatically on the coiling machine, there is no additional cost to the purchaser. Compression spring ends are almost always closed because in most applications it makes very little difference whether the ends are closed or open.

Increase wire diameter. Coil tangling results whenever the separation between coils is equal to or greater than the wire diameter. If this can be avoided, tangling will be largely eliminated. However, low gradient springs may often tangle if the coils can be easily forced apart. The difficulty of untangling increases with increasing spring index (ratio of coil diameter D to wire diameter d); large thin coils are harder to untangle than small thick coils.

The spring index can be reduced by increasing wire diameter. Additional coils must then be specified in

order to retain the spring gradient. It is not practical, however, to increase the wire diameter of compression springs when free length is close to solid height, because a larger wire diameter will reduce even further a narrow deflection range. In some cases it may be possible to reduce the mean diameter D of the spring and simultaneously reduce the wire diameter to maintain the spring gradient. Neither of these design solutions to excessive tangling affects the free length, gradient, or load-at-length characteristics of the compression spring.

Increase hook openings. The hooks on extension springs are responsible for tangling, which can become severe enough to require individual attention to each spring. A hook opening less than twice the wire diameter can make untangling a long and tedious job. In general, an opening should be either smaller or *much* larger than the wire which might enter it. In some cases it would be possible to close the loops entirely. There are few spring applications where some one of these changes in the hook opening cannot be allowed. The same principles apply on extended ends, hook or eye openings on either extension springs or wire forms.

Special Packing to Avoid Tangling

There are many practical mounting and packing techniques designed to separate springs or groups of springs during shipment. The packing cost usually increases as the number of springs in separate units decreases, and is highest when each

spring is individually wrapped. The extra cost may be justified when balanced against production delays and time spent in untangling. As a general rule, it is recommended that special packing be considered for extension springs with spring in-

dexes larger than 15. In the illustration showing small compression springs being mounted on adhesive, the small pile of springs at the left, picked at random from a tote box, shows that these springs tangle only in groups of two or three, and many

Some springs are so small that individual handling is impractical, yet have a tendency to tangle badly. They can be mounted at the coiler by moving an adhesive sheet back and forth under the outlet tube to get thin and even distribution, then stacked in a carton for shipment.



Typical Examples of Spring Tangling

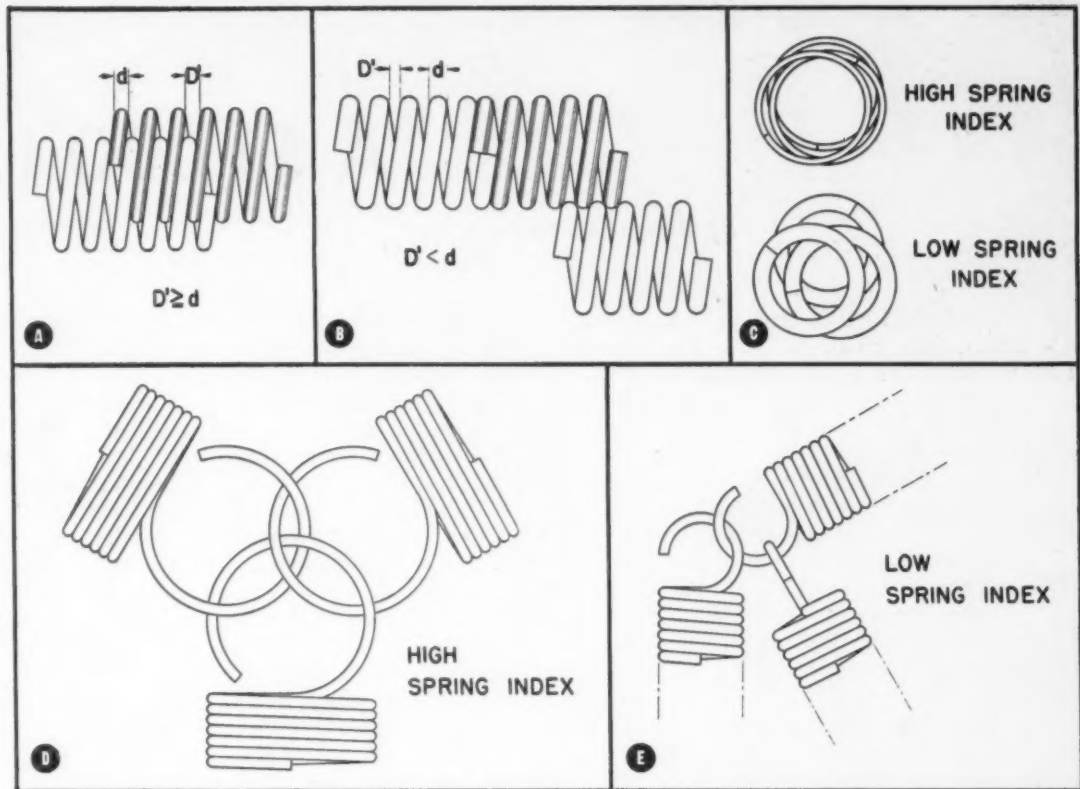
A. Where coil separation is equal to or greater than wire diameter, tangling and jamming can be a serious problem.

B. Where wire diameter is greater than coil separation, tangling occurs only when the coils can be easily forced apart.

C. Large thin coils (high spring index) are harder to untangle than small thick coils (low spring index).

D. Wide hook openings have a tendency to tangle, but they are also easy to untangle.

E. Large limber hooks, with narrow opening, can be very troublesome when multiplied by thousands in a lot.



do not tangle at all. However, the purchaser of this lot felt that tangling was sufficient to warrant the special mounting.

Springs are usually separated at the time of shipment after coiling, heat treating, plating, and inspection. Some types of springs are separated directly at the coiler. For example, compression springs that have been coiled and cut may slide down a string and pile up on a length of wire attached to the string, which is positioned so that the wire coils around the string and

falls when cut. The mounting wire may be as long as is necessary to hold an entire lot, so that the coiler need not be stopped during production. After production has been completed on a given lot, the mounting wire is coiled, or cut into sections and then coiled, and placed in a carton for shipment.

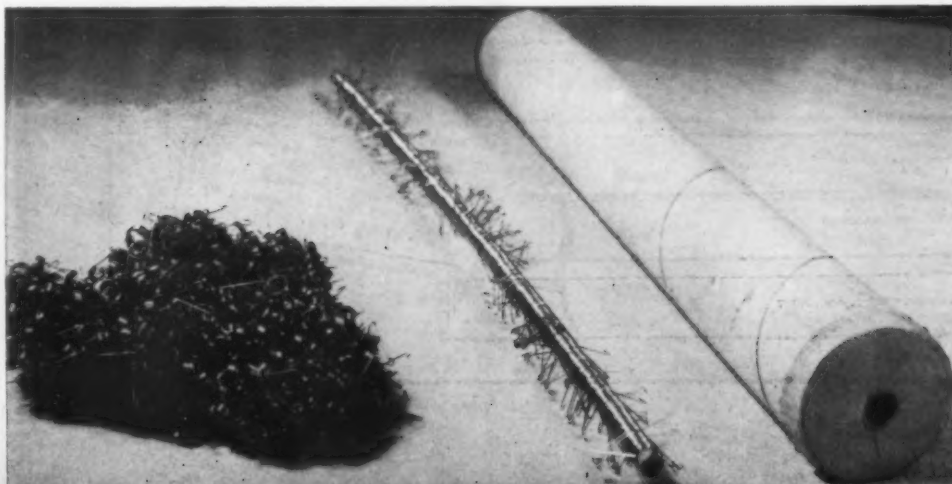
Springs also may be dropped into paper tubes at the coiler. The tubes, having a diameter slightly larger than the outside coil diameter, are then sealed and packed for shipment to the buyer.

A similar effect has been obtained in the case of torsion springs with extended hooks, by mounting them over paper tubes or cores, which are then inserted in cardboard cylinders.

Springs can also be mounted by spotting them individually in rows on adhesive sheets or strips, from which they can easily be removed individually as needed. When springs are so small that it is impractical to handle them individually, in spite of a tendency to tangle badly, a similar effect is achieved by distributing them over an adhesive sheet at the coiler. The sheets are then stacked in a carton for shipment. Another technique similar to the use of adhesive sheets is to place springs over pins set at intervals on boards. The object in each case is to avoid contact between springs, thus eliminating the possibility of tangling.

Springs are shipped in groups by (1) placing small numbers of them between layers of paper in a carton; (2) packing fractions of a lot in small boxes; (3) inserting springs in coin envelopes (particularly useful for extremely small springs); or (4) wrapping small bundles of springs in masking tape.

A real toughie—torsion springs with two open extended hooks—solved by slipping them over a paper core and enclosing in a cardboard cylinder. The tightly tangled lump at left shows what the buyer's problem would be without this packing method.



Want to save 91% of paperwork?

A \$1,000 Idea for

By Dwight G. Baird

REVAMPING the system for purchasing castings was the idea which won a \$1,000 suggestion award for Lawrence F. Reno of the Die and Machine Plant operated by the Fisher Body Division of General Motors in Detroit. The suggestion by Mr. Reno divorces from this operation approximately 91% of stenographic time formerly involved, and up to 75% of the buyer's time spent on these items, and greatly simplifies the processing of forms and duplication of file information.

The new procedure is a common

sense application of the familiar system of blanket orders and material releases, replacing individual requisitions and purchase orders on each recurring requirement.

Under the former system, an order for castings originated in the plant as a purchase requisition. This was sent to the Purchasing Division in the Fisher Body General Offices, which in turn selected the foundry with which the order was to be placed, carried on the necessary negotiations, and issued the purchase order to the vendor. The mechanics of this procedure

included transcribing the specifications and other pertinent information listed on the requisition to a purchase order form, and the issuance of from six to eight copies of the latter to the accounting and other interested departments, where they were processed and filed.

Under Reno's award-winning system, a blanket purchase order is now issued once each year to the outside sources from which castings are normally purchased. Terms and prices, so far as possible, are determined at this time. Requisitions are replaced by a material release form.

FROM THIS

FROM THIS

Under the previous system, each time costings were required, a requisition was prepared at the plant, initiating a complete new purchase transaction. This process might be repeated several times in a single month.

Complete description of material needed must be transcribed to the purchase order, duplicating clerical effort and requiring check for accuracy to avoid errors in transcription.

Information included on requisition does not appear elsewhere in purchase records or on order form. Requisition must be retained as a file record covering the transaction.

The requisition starts a chain reaction of paper work — one or more purchase orders issued, with six to eight copies of each order to be distributed, processed, and filed in purchasing, manufacturing, material control, receiving, and accounting departments.

Four copies of each requisition are routed to various departments. Since the form serves merely to initiate purchasing action, follow-up may be required in the originating department to see that this action has been taken and for information on status of the order.

PURCHASE REQUISITION
ORIGINAL

NUMBER 10
P. O. FORM 100

BUYER: _____ DATE: _____
APPROVED: _____

PURCHASING DEPT: PLEASE PURCHASE THE FOLLOWING
DETROIT CENTRAL PLANT

SCHEDULE	QUANTITY & UNIT	DESCRIPTION OF MATERIAL, OR SERVICE	PRICE AND UNIT
SCHEDULE 1			
SCHEDULE 2			
SCHEDULE 3			
SCHEDULE 4			
SCHEDULE 5			
SCHEDULE 6			
SCHEDULE 7			
SCHEDULE 8			
SCHEDULE 9			
SCHEDULE 10			
SCHEDULE 11			
SCHEDULE 12			
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SCHEDULE 98			
SCHEDULE 99			
SCHEDULE 100			

APPROVED: _____
PURCHASING DEPT. FILE

2 RETURN TO ORIGINATOR

3 ORIGINATOR'S FOLLOW-UP
FILE COPY

4 MATERIAL CONTROL DEPT. FILE

Better Purchasing

When castings are required, the plant submits the original and five carbon copies of this form, stating the part number, type and quantity required. The Purchasing Division determines the source of the castings, inserts the supplier's name, blanket purchase order number, and price, signs the original and forwards it to the vendor, without the necessity of copying listed information and issuing an additional form. Carbon copies are distributed as in the case of purchase orders.

The blanket order system does not in any way by-pass the Purchas-

ing Division, nor does it preclude competition or the use of alternative sources of supply. In addition to the obvious advantages in slashing paper work and saving of buyers' time on repetitive orders, there are substantial benefits to purchasing in that a more thorough job of selection and negotiation can be done on the once-a-year order, and the filing of material releases with the blanket order of which they become a part provides a complete history of purchase and use, item by item, in a single, coordinated record.



Award winner Lawrence F. Reno demonstrates the tremendous simplification made possible by the use of blanket orders and material releases. The big stack of folders represents one month's paper work involved in the purchase of castings. The simple form in his other hand has eliminated 91% of this chore.

TO THIS

[illegible]

A minimum of paper work is required in the purchasing department. No additional forms are made out and issued. Buyer selects and indicates source, inserts appropriate order number to which the release applies, inserts price, and signs release as order.

Using the material release system, actual purchasing effort on each item is simplified to a single, thorough, once-a-year transaction covering an entire year's requirements in a blanket order or contract with one or more suppliers.

All terms and conditions of purchase order form are incorporated by printed reference.

Original copy goes to vendor. No new purchase order required.

Separate requisition file is eliminated in purchasing department. Release copies attached to original blanket order bring complete history of purchases into one coordinated record for each item.

One copy replaces three (requisition, follow-up, and purchase order) in originator's file. Since material release constitutes the order, no follow-up is required.

Duplication of material description, as furnished by originating department, is eliminated.

Standard purchase order distribution of carbon copies keeps all departments informed.

Cut-away carbon in price section provides space for record of deliveries on the receiving copy.

1 - VERSION

2 - PURCHASING DIVISION - GENERAL OFFICE

3 - PURCHASING DIVISION - GENERAL OFFICE

4 - ACCOUNTING DEPARTMENT - PLANT

5 - ORIGINATOR'S FILE

6 - RECEIVING DEPARTMENT

One type box, in six sizes, handles entire line

Container Economies

By E. O. Van Dusen, Purchasing Agent, Mechanics Universal Joint Division, Borg-Warner Corp., Rockford, Illinois



Two of the hundreds of different finely machined automotive parts packed for shipment. Careful selection of box sizes permits fitted packing like this without danger of shifting or damage in transit. Shipping weights of the boxes shown are 240 and 92 pounds, with container tare weights of only 8 and 5 pounds respectively.

The wirebound boxes come in flattened "mat" form, wired in bundles of six, complete with ends. They can be stacked beam high, requiring a minimum of floor space for storage; are easily handled with a fork truck.

Assembly of the box is an easy one-man operation in the packing room. A minimum supply of the assembled containers is required at any one time because of the ease and speed with which they can be set up as needed.

THE packing and shipping room of the Mechanics Universal Joint Division, Borg-Warner Corp., is at the opposite end of the plant from the Purchasing Department—but presents graphic proof that the beneficial influence of Purchasing stretches a long way.

At this big plant, where we make thousands of different automotive parts of widely varying sizes, weights, and shapes, Purchasing has duties beyond simply buying materials and supplies. As a result of that policy, we are able to make our know-how of economical operations felt in many different departments

with the cooperation of various department heads.

Not the least of these is the packing and shipping department, where we have helped to achieve noteworthy economies by bringing about a standardization of shipping containers and packing techniques that we believe is not excelled anywhere.

Like all other successful manufacturers, we demand that our packing be economical in all ways as well as thoroughly protective so that our customers will receive goods in perfect condition.

The packing and shipping economies we demand include not only

the lowest possible original container cost consistent with high-type protective packing, but also low comparative tare weight, savings in man-time needed to assemble and pack containers, conservation of floor space for storing containers both before and after they are assembled, savings in man-time in changing from packing one product to packing another, and elimination so far as possible of the expense and labor involved in filing and settling claims arising from shipping damages.

We have achieved these economies by adopting one type of ship-

ping container, in six different sizes. The purchasing department at the Mechanics Universal Joint Division is proud that it had a role together with the Division's packaging engineers in developing the present packing-for-shipment program that has resulted in such economies at the same time it has won appreciable good will from customers and the company's own warehouses.

By restricting our shipping containers to six different sizes of one type, we have eliminated the costly confusion that inevitably results from the use of several different

types or many different sizes of containers. Surveys and exhaustive studies proved that we needed only six different sizes of wirebound boxes to pack practically our entire line of thousands of different products, whether they needed to be hand-placed in shipping containers, jumble-packed, or cartoned first and then over-packed.

The standardization of shipping containers in a few sizes permitted us to organize our packing department so that it can instantly switch from packing one product to packing another of an entirely different size, weight, or shape. This means there is no lost man-time when the nature of the product changes. The packing department knows in what size box every product is to be packed and how it is to be packed. The only requisite is to have a constant supply of boxes of all sizes instantly available.

The nature of our wirebound boxes with all-bound ends permits us to keep such a supply available without waste of valuable floor space. Only a few seconds are required for one man to assemble a box, hence there is no need for more than a very few to be assembled and ready for use at any one time.

Economy of storage space results from the fact that the wirebound boxes are shipped to us flat and with the ends already attached, so that hundreds of boxes can be stacked ceiling-high. They are handled quickly and easily by fork trucks, even when they are not resting upon pallets.

That we achieve maximum shipping protection is attested by the total absence of damage during shipment due to container failure from ordinary shipping shocks and jars.

While packing for shipment may not technically be a Purchasing function, we believe that Purchasing definitely has a vital role in such packing, as in most other operations, because of its duty to protect its company against extravagances and losses of all kinds and always to seek out the most efficient and most economical—not always the "cheapest"—methods.

That is why we of the Purchasing Department take pride in the record of our packing and shipping department and the good will that proper packing for shipment has created among our customers.

To us, this seems to present a clear link between purchasing and selling—which is as it should be!



Consolidated orders of consumer-size packages are readily packed for shipment in a single container, eliminating the nuisance, expense, and danger of loss or delay, involved in multiple small packages.

Axle drive units are long and bulky, but they fit into this coordinated packaging program along with the smaller cartoned products. Construction of the box provides a high degree of resiliency to absorb shocks of transit and handling.



Standard packing instructions for various size units are correlated with the standard size boxes. This simplifies work in the shipping department, assures economy of space, snug fit, and safe transport.



Morris B. Pendleton
President, Proto Tools

**An interview
by Fred M. Burt**

SALESMEN and other vendor representatives form an opinion of a company through their contacts with the purchasing agent and by the conduct of the purchasing department. If the qualities of management are so judged, it is necessary that the purchasing agent accurately reflect the basic philosophies of management. That condition is most likely to prevail when the purchasing agent is a definite part of management, having a proper part in the formulation of its policies.

"Purchasing agents are usually in a position to create more good will for their company than almost any other corporation official," says Morris B. Pendleton, President of Proto Tools, of Los Angeles, Cal., and Jamestown, N. Y. "This is because of the variety and nature of their contacts, both inside the organization and in dealing with vendor companies.

"This management expects its purchasing agent to be a creator of good will for the company—inside the organization by supporting the production departments, which operate on a cost incentive basis, and with outside companies through the proper handling of interviews with salesmen.

"There are a lot of new salesmen calling on purchasing agents in these days, and many whose experience has been principally that of accepting orders in a sellers' market. Some of them don't know how to express themselves and are untrained in making a good 'sales pitch' that will give the buyer the information he



The standard line of Proto Tools products includes more than 1,250 items; hundreds of special tools are also manufactured.

needs about the product. It has never been good policy for a purchasing agent to put on a deadpan face and watch the salesman sweat it out; that merely wastes time for the purchasing agent and the salesman alike. By developing a sympathetic and inquisitive attitude, the buyer can encourage the salesman to tell his story well.

"The better the feeling the salesman has toward the purchasing agent, the more likely the buyer is to get the salesman's best deal, or, in these times of shortages, to get preference on needed materials. In selling, when price and quality are equal, personality gets the order. Similarly, when there are many people eager to buy the same product, personality counts, and it is the P. A. who is best liked that gets the goods. There's a lot of salesmanship involved in good purchasing.

"The higher the caliber of salesman or sales engineer calling on a

purchasing agent, the better will be the service available to him in the way of pertinent and reliable suggestions and advice relating to the company's requirements, and of new materials and equipment and their manner of use for the greatest benefit to the company's operations. The better the purchasing agent is liked, and the more he is respected, the more care will be employed by the competent sales engineer in passing along facts and ideas of particular value to the buyer and his company.

"Naturally, every salesman who calls can't get an order. If he does, be sure that he leaves with the feeling, 'I surely will see to it that he gets service on that order; I want to come back here again.' If he is not successful, he should nevertheless carry away the conviction, 'I didn't get the order, but this is certainly a swell outfit to call on.' Salesmen are extroverts. They swap experiences and are usually talking

PURCHASING AGENT

about some one. Handle them so that they may talk about you—but favorably.

"The purchasing agent should avoid shrinking his usefulness by unnecessarily narrowing his sources. There is a continual change and turnover in the business community. Many new faces and new companies have products to sell. Particularly in the West, there are numerous companies manufacturing desirable merchandise, who haven't been in that business, or in that territory, before. They deserve a hearing and full consideration. The purchasing agent who refuses to deal with newcomers may miss many splendid buying opportunities and the chance to develop valuable new contacts and sources.

"We expect our purchasing agent to be approachable and available. The salesman's time is important to himself and to his company. He cannot always accommodate his schedule to restricted calling hours. Here in the West, we receive many calls from people who have travelled hundreds or even thousands of miles to see us. The 'Welcome' leaflet that greets them at our reception desk has this to say:

Steel, in a wide range of forms and sizes, is the principal item purchased, and must be on hand as needed.



Time Is Valuable

Just as we appreciate prompt and courteous treatment of our representatives, so it is our desire to give all visitors the very best attention possible. . . No matter how busy we are, we do want to see you and will try to give you the time required to handle your business properly.

The leaflet includes a list of the company's key executives and department heads, whom the caller might wish to see. This includes our Purchasing Agent, James R. Dysert, in charge of purchasing and outside production. Following the list there appears this simple statement:

When to See Them

Office hours for most departments are from 8:00 a.m. to 4:30 p.m. Offices are closed on Saturdays.

This open door policy is greatly appreciated by our out-of-town visitors, and it is not abused by the local suppliers. Mr. Dysert is available to callers until 5:00 p.m., when the switchboard closes.

"Management expects its purchasing agent to be informed," Mr. Pendleton continued. "It expects the purchasing agent to scout trade association meetings, technical society meetings, and trade shows, for contacts and information; to read business magazines meticulously to pick up all the new ideas possible;



James R. Dysert
Purchasing Agent

Who to see

President	Morris B. Pendleton
Vice-President-Secretary	
Treasurer	Henry C. Baumgartner
Vice-President-Manufacturing	Carl W. Coslow
Vice-President-Metallurgy	F. J. Robbins
Assistant Secretary-Treasurer	D. M. Brice

ACCOUNTING	Henry C. Baumgartner, Controller
	Willard J. Lohr, Assistant
	D. M. Brice, Manager
CREDIT	Carl W. Coslow, Vice-President
MANUFACTURING	A. L. Hentley, Works Manager
	C. G. Ryan, Superintendent
	George Carlsson, Asst. Controller
	Ralph T. Tamm, Chief
	Glen C. Cline, Chief
	Nels Nelson, Asst. Superintendent
	J. M. Wicks, Plant Engineer
	Courtesy Overin, Superintendent
	James B. Dyer, Purchasing Agent
SALES	Robert M. Case, Manager
	Sue Kelley, Manager
	R. C. Walcott, Editor
	Dorothy Jensen, R.S.
	Toni Watts, Sales Manager
	J. G. Allen, Export Manager
	Clifford Fennell, Manager
	H. D. Norton, Manager
	Louis Greenblatt, Manager
	Don L. Frost, Superintendent
	Harold Harrell, Manager
	Paul D. Burch, Manager
	Henry Munkler, Manager
	J. G. Allen, Export Manager
	T. A. Winters, Assistant Manager
	Howard Potts, Manager
	H. D. Norton, Manager
	W. W. Foster, Manager
STOCK TRANSFER	Blanche Rogers, Transfer Agent

W

Office hours for most departments are from 8:00 a.m. to 4:30 p.m. Offices are closed on Saturdays.

The open door policy for business callers at Proto Tools applies to every executive and department manager.

to check commodity quotations, market reports, and business trends as reported in the daily newspapers; to investigate new materials and new methods of production. The purchasing agent should ride in the cab of the locomotive and not in the caboose, so that he can get illumination on matters as he approaches them, and not after he has passed by.

"The success of a manufacturing enterprise can usually be summed up in three short words—*Cost of Production*. The purchasing agent who lives up to his responsibility can be a very influential factor in keeping these costs down to a profitably low level. Therefore we want our purchasing agent to be big enough in his thinking, in his outlook, and in his capabilities, to be a real part of management—one who can sit in at the time production planning is under way, not after it has been done. Without this participation, production planning cannot be successful or effective.

"Furthermore, management wants

ment functions can be delegated to others to do the preliminary groundwork, thus developing a situation of sharing responsibility for the promoting of all-essential teamwork. Credit must be given to others in the organization who conceive ideas, and the best way for the P.A. to garner ideas and to get cooperation is to have the reputation of being generous in giving credit to others. It is masterly psychology to make the other fellow think that an idea is his own; he then goes overboard in the honest effort to make it work.

"Properly placed in top levels of staff and management councils, by

beyond appreciable control, the affairs of the purchasing department must be regulated in relation to them. The P.A. cannot break the force of an oncoming trend, but rather he must anticipate and conform to it instead of breaking himself against it.

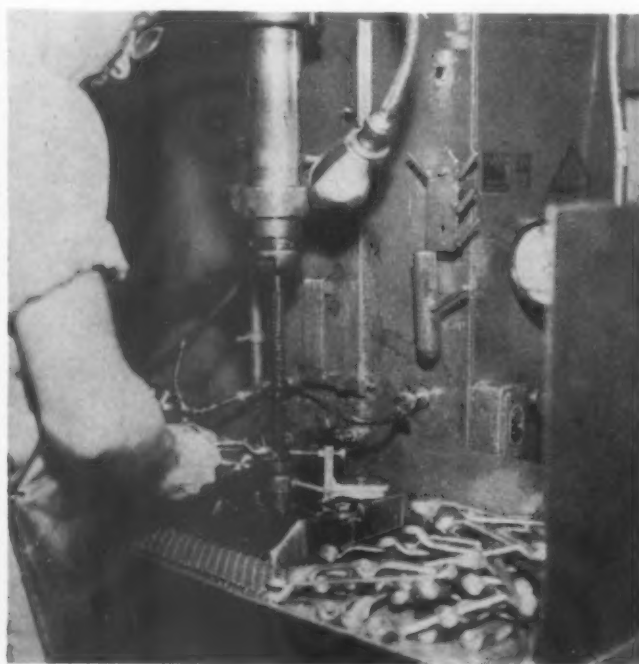
"We also expect our purchasing agent to be a political economist. He must understand governmental rules and regulations. The government papermill never stops grinding out new rules. As our political economy becomes more complex, so must the rules and regulations. There is no advantage in griping and fighting them; it is better to use the energy in coming to understand and getting along with them.

"Our purchasing agent is expected to understand the functional organization of the company, from top to bottom. He must know whom to contact, when to touch him, and which way he will jump when contacted. No other man in the organization, unless it be the personnel director, has contact with so many in the organization.

"We are all mindful of practices where officers of the company may place business with their friends, and for which there may be reciprocity or other favors. If the purchasing agent runs into such a situation that is unhealthy for the general corporate good, and is not at liberty to break it up, his self-respect should demand that he place the facts, insofar as he has knowledge thereof, before his immediate superior, that the responsibility may pass on and possibly find a solution at higher levels of authority.

"Reciprocity has always been a problem for the purchasing agent. Other things being equal, he should give the breaks to those who have been of help to the company, such as in extension of credit, fair dealing, purchase of the company's products, help in the earlier days of the company's growth, technical assistance, cooperation in times of short supply, and in other similar ways. However, this reciprocity should not be allowed to move out of its normal sphere of importance. Favors should be granted only when price, quality, and service are equal, and then only when the 'favors' are completely impersonal, on a company basis.

"To summarize, all that management expects of the purchasing agent is that he be a practical magician—that he make available the unavailable, define the indefinable, and unscrew the inscrutable."



Broaching the openings in box wrenches. Efficient, low cost production schedules are possible only when supported by efficient purchasing.

a purchasing agent who is alive to what is going on in the technical and production departments of our company. Above all, we want a purchasing agent who can make continuous suggestions for the betterment of production. The P.A. is the man who, by his decisions, builds up or weakens not only his own operation, but the operations around him.

"The purchasing agent is expected to be a catalytic agent, and not a rubber stamp. He must be the coordinator of all functions of procurement. He must not let them become so decentralized that he becomes a rubber stamp for others, nor must he centralize these functions in himself to the extent that he makes rubber stamps out of others.

"Many of the purchasing depart-

ment intelligent management determination, the P.A. becomes a combination of soothsayer, mind-reader, and diplomat, as well as a catalytic agent for the development of ideas. He is a conductor, not an insulator, of management policies. In my opinion, all persons at any level of supervision, from the president to the foreman, are all a part of management.

"The purchasing agent is expected to be a financial economist. He must understand trends, prices, availabilities, and all the other factors and phases of our complex economy. It must be remembered that 50% of the factors in any success equation are those factors outside of and beyond the control of the purchasing agent and his company. Much can be done directly about the other half. But for those

More Value for the Maintenance Dollar

A summary of ideas and methods presented at the Second Annual Plant Maintenance Conference, reported by George E. Henry

INDUSTRIAL plant maintenance represents an annual expenditure of \$8,000,000,000, declared a speaker at the Second Annual Plant Maintenance Show and Conference recently concluded at Cleveland. The large registration at the conference (running well over 9,000 and including a liberal proportion of purchasing men), the huge exhibit of equipment and materials, and the keen interest in the meetings, provided impressive testimony

of the growing recognition being accorded to the role of maintenance in lower-cost plant operation.

The purchasing agent has an important part in the maintenance program—in the selection of equipment with due consideration for maintenance and safety factors, the need for balanced inventories of supplies and replacement parts, the increasingly serious factor of lead time requirements in procurement, and the cost of maintenance items

themselves. He is a vital member of the team in a continuing program that demands cooperative action on the part of all concerned, from top management down.

The following excerpts from conference addresses by key men in outstanding companies bring you a concentrated digest of the wealth of practical experience presented to conference audiences, keyed to the specific interests of the purchasing man.

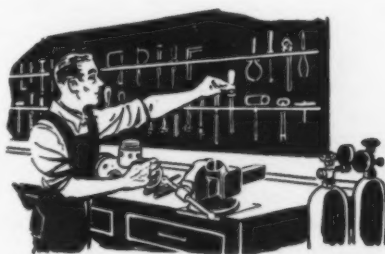
Maintenance Appropriations Help to Guide Program

R. S. Williams, Plant Engineer, DeLaval Steam Turbine Co., Trenton, N. J.: Maintenance at our plant functions under an appropriation system. Funds are made available by an Appropriation Application, consisting of two forms. The first signifies whether the appropriation is a Special or an Annual one, what division and departments benefit, a concise outline of the project, the economic or other gains to be derived, whether it is of a capital or expense nature, estimated cost and estimated closing date. A Special appropriation is for a project that is of one nature and will not be repeated; it may be for the modernization of an entire department, or for the purchase of a single piece of equipment.

The second form is the Appropriation Schedule. Here each phase of the project is described, and the

capital or expense account number is assigned.

The writing of appropriations serves a good purpose. They make us plan our activities. They present a clear picture of what management must provide for, or what management feels is unwarranted or should be postponed. They make us scratch for new materials and new methods so that our maintenance dollar will go farther.



Good Organization Needed for Effective Maintenance

F. A. French, Chief Plant Engineer, John A. Roebling's Sons Co., Tren-

ton, N. J.: Most important of all, to do a good job of plant engineering and maintenance, is to have a good organization, staffed with competent technical men. A good, centrally located maintenance and construction shop, with plenty of room for good housekeeping and good working conditions, is invaluable. It should have as many up-to-date tools, both stationary and portable, as can be justified to handle maintenance and construction work during normal plant operations. An adequate central receiving and stores warehouse should also be provided for safe and orderly stocking of maintenance parts and materials; it is here that the best records of parts usage can be kept, and parts and material needs anticipated. A cost system for charging maintenance material and labor against individual machine units or groups will serve an important use when considering replacements or changes to reduce maintenance costs.



Lubrication Requirements Can be Simplified

L. B. Sargent, Jr., *Assistant Chief, Lubricants Division, Aluminum Company of America, New Kensington, Pa.*: A warehouse full of many different kinds of special lubricants is considered normal in many plants. This sort of specialization, with all of its attendant ills, is not necessary to plant efficiency. There is a trend toward consolidation of lubricants, i.e., toward the use of multi-functional materials. In my own company, for example, where we were at one time using about 850 different lubricants, we are now using only about 150. This has resulted in streamlining inventories, warehousing, and purchasing, and reducing total lubricant costs without harming efficiency or equipment.

All fluid lubricants come within a few basic classifications such as straight mineral oils, EP gear oils, crankcase oils, etc. Within any classification, we can make a further breakdown into viscosity grades. This rather simple analysis will develop a certain number of lubricant types covering most of the company's needs, depending on the operations involved. Specials will be in the minority.

Once such a study has been made, the work involves weeding out undesirable materials and maintaining close liaison with the purchasing department. The purchase of any lubricant then becomes a function of the purchasing agent, who will have a choice of any one of a number of materials which occupy the same niche in the classification chart. This allows contract buying and promotes competition among suppliers. The same procedure can be applied to greases.

It is our belief that most of us are suffering from over-specialization, and that respectable economies can be realized by a thorough study of lubrication requirements. Some of the advantages of a consolidated system, using a minimum number of different lubricants, are:

1. Decreased inventories.
2. Decreased storage space.

3. Possibility of contract purchasing.

4. Decreased initial costs.

5. Less possibility of lubricant mix-up.

6. Decreased paper work.

7. More flexibility in buying.

8. Better insight into lubricant performance, with a good possibility of showing and decreasing hidden repair and maintenance costs.

Performance Standards for Lubrication

D. P. Morrell, *Supervisor, Fluids and Electrical Section, Design and Standards Department, Ford Motor Co., Dearborn, Mich.*: Recognizing the need for planned lubrication practices, Ford Motor Company formed a Lubrication Equipment Sub-Committee made up of representatives from staff and all operating divisions. As a result of the efforts of this committee, with excellent cooperation by several suppliers, we have recently published a set of "Lubrication Standards for Industrial Equipment."

The general pattern of these standards is very similar to the Joint Industry Conference Standards already in existence for electrical, hydraulic, and pneumatic applications. A few typical paragraphs will give some idea as to how these standards are written:

"Lubrication systems and industrial equipment shall be so designed as to prevent the contamination of coolant and hydraulic systems by the lubricating fluid.

"All machine tools and equipment shall, when practicable, be lubricated by centralized systems, utilizing such means as header blocks, manifolds, manual and automatic pumps.

"Self contained machinery and equipment components, and components which, because of their design characteristics, require infrequent lubrication (electric motors, etc.) should not, in most cases, be part of a central lubrication system."

These lubrication standards, by being good engineering practice standards rather than dimensional or material standards, point out a goal of performance and service which permits the manufacturer the full scope of his know-how and ingenuity in the design of equipment. For complete success of any lubrication program, it is essential that full consideration be given to both good engineering practices and good shop practices.

Planning and Scheduling a Lubrication Program

D. F. Hollingsworth, *Lubrication Consultant, E. I. du Pont de Ne-*

mours & Co., Wilmington, Del.: The purchasing of lubricants, specifying the correct grades, and making them available where and when needed, is in itself a major field. There are three steps involved:

1. There should be an evaluation of the lubricants necessary for each machine to be operated, together with an estimate of annual consumption.

2. Requirements should be consolidated so that a minimum number of lubricants may be kept on hand.

3. A guide should be established for the purchasing agent to make sure that purchases conform to requirements.

A few years ago, a large plant was found to have on hand 900 drums and 80 different varieties of lubricants. A lubrication engineer subsequently specified a dozen types which would meet all needs, and the inventory was cut to one-sixth its original size.

In another plant there are more than 2,750 machines. To lubricate them required more than 1,500,000 inspections a year. After the inauguration of lubrication scheduling, the number of inspections was cut to 1,200,000—a drop of 20%. This resulted in savings of several thousand dollars in application costs, and the number of equipment failures was curtailed.

The lubrication engineer needs to be up to the minute on new developments in his field. There is always something new coming along which makes the "impossible" of a year ago into the "routine" of today. This was the case, for instance, with the development of lubricant additives which eliminated high pressure compressor valve fouling, which for many years had been regarded as inevitable.



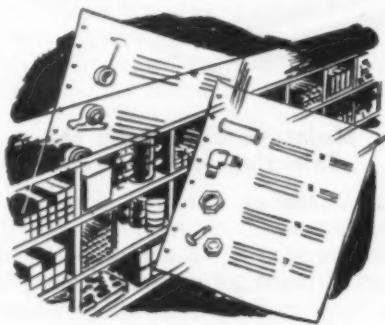
Too Frequent Lubrication, Too Many Lubricants

T. R. Witt, *Division Maintenance Engineer, Tennessee Eastman*

Corp., Kingsport, Tenn.: The equipment in our plant operates 24 hours a day, seven days a week. The number of individual bearings in an installation of this kind runs into thousands. In one department alone, there are 60,000 anti-friction bearings in operation. There are thousands of high speed spindles. Approximately 4,000 motors, most of which are the ball bearing type, are used to drive this machinery.

Any ball or roller bearing that is greased more often than every two or three years is being greased too frequently. In good locations, motor lubrication may be extended to nine or more years between greasings.

We have set up a lubrication committee consisting of maintenance men from all divisions of the plant, with representatives from the purchasing and engineering departments. It was found that 57 different lubricants were being carried in stock; this number was brought down to 8 oils and 3 greases. The committee meets quarterly, and much benefit is derived from the exchange of information and experience regarding lubrication problems.



Spare Parts Catalog

D. G. Jamieson, Assistant Plant Engineer, Canadian Synthetic Rubber Ltd., Sarnia, Ont.: To maintain equipment efficiently, certain spare parts must be stocked. Reordering of parts should be automatic.

We have built up a spare parts catalog and established maximum-minimum stock figures. The catalog is indexed to the plant equipment numbers, with a numerical suffix for each part. Opposite the part is indicated whether the item is stocked or not. If a number of pieces of equipment are identical, parts are listed for only one, and the others are cross-indexed to it. Manufacturers drawings and part numbers are of course also listed.

Within a year after the inception of this system, unscheduled down-

time for maintenance, in our most demanding area, was reduced by 19.6%.

Maintenance Records Start with the Purchase Order

W. A. Perry, Asst. General Superintendent—Services, Inland Steel Co., East Chicago, Ind.: A successful preventive maintenance program can be properly organized and controlled only through the use of records and reports. This starts with the purchase order, which contains all the information about the item. Prints and diagrams are specified in the order. On the back of the same order we record the prints, diagrams, bulletins, etc., received and where they are distributed. These records have proven beneficial in reordering equipment and obtaining additional information accurately and promptly. The purchase record indicates the time required for delivery, which is a deciding factor in determining the order point and quantity to order.

Records of this type have enabled us to be systematic in our inventory controls, assuring that the necessary amount of replacements are available without being excessive. Through standardization and specifications, equipment is of known and proven value, thus minimizing the amount of maintenance required.

Data sheets provide ready reference for various types of information. For example, an index is maintained which classifies each motor in the department as to drive and motor type and refers to the Motor Data Book. Data sheets in the book give all pertinent information, including serial numbers and other name plate data. We also have data sheets on pinions, brakewheels, and other items. Copies of the Brush Data Sheets are sent to the manufacturer to insure that proper brushes are supplied. They also supply the manufacturer with information for making any cost reducing modifications.

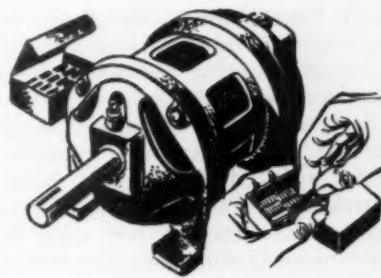
Maintenance Factors in Electrical Equipment

K. C. Mobarry, Industrial Application Engineer, General Electric Co., Cleveland, O.: Designers spend much time and effort to make electrical apparatus simple and easy to keep in good running order. Too often, salesmen fail to point out to the purchaser the value of easily maintained equipment, and too often, when it has been pointed out, the purchaser fails to properly evaluate the maintenance problem.

Use of nitrogen sealed power transformers reduces oil sludging, increases oil filtering periods, and greatly extends the life of the transformer. Askarel instead of oil or air as a cooling medium means less fire hazard, simpler installations, fewer cleaning problems, and less liquid maintenance than oil.

Motors like best the least restricting type of enclosure that the application will permit; i.e., a motor will run cooler and carry heavier loads, and its insulation and bearings will have longer life if it is wide open to the passage of free air. Motor applications should be studied thoroughly in the interest of low maintenance costs, to determine whether any other acceptable method is available before resorting to restricting enclosures on the motor itself.

Availability is an important factor, and the use of standard equipment simplifies the renewal parts stocking problem. Service rendered by the supplier of an electrical control should influence its selection. Local stocks in the supplier's warehouse reduce the necessary inventories of renewal parts.



Preventive Maintenance Aids Production

M. A. Travis, Plant Engineer, Nash Motors Body Division, Milwaukee, Wis.: Management must realize that maintenance is a normal function of business as the first step in the installation of a proper maintenance program. The maintenance function has a direct effect on the production of a plant. Condition of plant equipment is a dominant factor in product quality control, manufacturing cost, production rates, production control, plant safety, industrial relations—in short, the profitable operation of the business.

Work orders and records are the basis of preventive methods, since preventive maintenance depends on knowing what to prevent and when to take the preventive measures. The essentials of equipment maintenance records are:

1. Complete identification of equipment and accessory parts.

2. A list of drawings, catalogs, and other data pertaining to the equipment, and where to find it in the files.

3. Plant location of equipment.

4. Service requirements.

5. Maintenance requirements.

6. A schedule of when these operations are to be performed.

7. Maintenance and repair record, showing costs involved.

8. Visual follow-up date easily seen to plan a week's work.



Proper Painting Increases Production and Safety

A. D. Buschmann, Plant Engineer, Perfection Stove Co., Cleveland, O.: Industrial painting has now become functional and is now a matter of dollars and cents savings through increased production, improved safety, reduced absenteeism, better housekeeping, and higher morale. The effectiveness of the scientific use of color is emphasized by results in all kinds of plants.

The Internal Revenue Bureau reports an increase of 5.5% in worker efficiency after proper color conditioning and task illumination in a punch card department, representing yearly payroll savings of more than \$13,000.

Cook Electric Co., Chicago, reduced its accident severity rate by 73% following a color conditioning program.

Zenith Radio, Chicago, reports a 65% reduction in accident frequency through color conditioning on riveting machines. Proper painting of assembly benches practically eliminated rejects, increased production by 7%.

In U. S. Quartermaster Corps Depots, certain types of accidents were reduced from a yearly frequency of 46.14 to 5.58 during the first year the safety color code was in use. Disabling injuries were reduced from 13.25 to 6.99 per million man-hours worked.

Maintenance painting is a justifiable manufacturing expense that returns good dividends. We can expect to gain important economies through:

1. Production increase and scrap reduction through better seeing.

2. Less absenteeism and better concentration on the job through eliminating eyestrain and headaches.

3. Better housekeeping because of workers' pride in clean surroundings and a natural tendency to keep a clean area clean.

4. Reduced accident frequency.

5. Improved employee morale.

Good Maintenance Starts at the Floor Level

E. F. Mumaw, Superintendent of Plant Service, Ford Motor Co., Dearborn, Mich.: Bad floors are an important factor in the cost of damaged goods, either in the rough or finished state. They cause increased maintenance costs on mechanized equipment, and are the principal cause of cut tires. Figures show a marked difference in the life and maintenance of truck batteries when floors are kept smooth.

Wood block flooring is very durable and affords easy removal for installation of conduit or alterations in a plant layout. There are many places, however, where this type of floor should not be used.

A good concrete floor has proved to be the most durable. High compressive and tensile strength depend on the aggregate used. Surface hardeners are of slight value in giving added strength because cement, which is the ingredient affected, takes little if any wear. We have used mastic materials successfully in many locations, chiefly for emergency patching when floor disintegration required immediate repair.

In our search for better flooring we have installed several thousand square feet of $\frac{3}{4}$ " emery floor topping in the foundry core room, elevator approaches, truck ramps and heavy trucking aisles.

Wax applications protect floor surfaces, but the safety hazard is greatly increased through the application of smooth hard finishes.

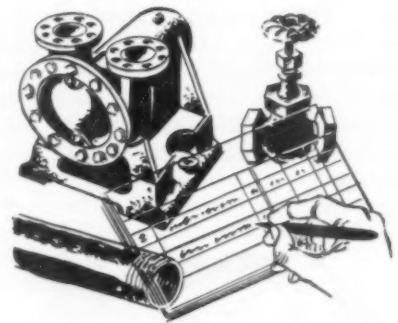
Keeping Floors Clean

G. L. Doty, Superintendent of Plant Sanitation, U. S. Rubber Co., Detroit, Mich.: Three years ago we had 165 people doing janitor work in the Detroit plant. By using improved methods and eliminating un-

necessary operations, we have been able to reduce our force to 113 people and are doing a better job.

We use mechanical sweepers in open areas, aisles and warehouses. Investment of \$7,500 in a street sweeper, which takes the place of three men, saved \$82,500 in ten years. Investment of \$4,000 in plant power sweepers saved \$37,000 in three years compared with hand sweeping.

We use a buffing machine after waxing on rubber and asphalt tile. Wax is removed occasionally with trisodium phosphate and hot water. On red masonry or Welsh tile, concrete or terrazzo floors, we find that by cleaning with Move-all concentrate we do not need to wax. The tile dries with a gloss that will last several days under normal conditions.



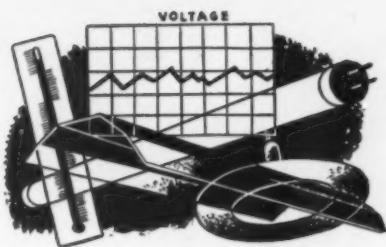
Maintenance Affects the Selection of Materials

H. L. Dunker, Manager, Engineering Department, H. J. Heinz Co., Pittsburgh, Pa.: The type of metal used in manufacturing equipment is an important consideration where there is any contact with food products. As hard as we try, and though our purchase orders specify stainless steels of a certain specification, we find that we receive pumps, valves, and other types of equipment containing copper, lead, zinc, etc., in larger quantities than are acceptable to our Quality Control Department.

An extensive study on various types of stainless steels, from the standpoint of corrosion resistance with various types of liquors containing acetic acid, led to the following conclusions:

If equipment is so constructed that it cannot be cleaned daily, Type 316 or 317 stainless steel is preferred over Type 304.

If equipment can be cleaned and brushed properly every day to prevent pitting, Type 304 is just as resistant as the 316 and 317, containing molybdenum.



Satisfaction and Service in Lighting Equipment

H. F. Keene, Senior Electrical Engineer, Western Electric Co., New York, N. Y.: Assuming that adequate standards of illumination have been determined, comparative costs of installation and of operation are likely to determine selection of the type of lighting source. Improper quantity or quality of illumination will probably result in dissatisfaction throughout the life of the installation, and in many instances will require expensive corrective action.

Where fluctuating voltage conditions are encountered, it may be desirable to utilize fluorescent sources, since the flicker in incandescent lamps under the same conditions might be unbearable. Consideration of temperature is often important; fluorescent lamps are much more critical than incandescent lamps at the extremes of temperature which may exist in industrial occupancies. In deciding between the two major types of fluorescent sources, we must weigh the effect upon cost of labor and material necessary for replacement of lamps and starters used in the preheat type as against the cost of maintaining instant start equipment.

Selection of materials and finishes for reflectors is important. To date, plastics have not been very prominent in industrial luminaires; steel has been most prevalently used. There are two popular finishes—baked paint or porcelain enamel. Slightly higher initial reflective surfaces can be obtained when using paint, but porcelain enamel has withstood the trial of many years' test of permanency more successfully. Poor reflective surfaces are possible with either finish, and due care should be taken to insure high reflectivity.

Cost analyses should be interpreted with caution. Most studies make use of a multiplying factor which, in effect, resolves all layouts to a base, usually cost per million lumen-hours. The design providing the lowest per million lumen-hour cost will not necessarily provide lowest net cost to the owner.

Lighting Equipment Maintenance

G. S. Ketter, Electrical Engineer, The B. F. Goodrich Co., Akron, Ohio: Lighting systems which are adequate at installation will rapidly depreciate if not properly maintained. The rules are simple:

1. Keep lamps replaced. In many cases it is economical to replace lamps before they finally fail.
2. Keep lamps and fixtures clean. When illumination decreases to 75% of its initial value, the equipment should be cleaned. A thorough cleaning at least twice a year is usually justified economically.
3. Keep surrounding reflecting surfaces clean.
4. Keep lighting equipment in good operating condition, mechanically and electrically.

At the Goodrich plants, drop cords with RIM reflectors are being replaced by mounting the fixtures on a conduit stem provided with a hook type disconnect device mounted on the ceiling; socket and plug for the fixture cord is also mounted on the ceiling. This type of installation allows easy replacement of the entire fixture; bulbs can be replaced using the stick. Experience has shown that drop cords become brittle after a number of years and may break off, resulting in serious accident.

The excessive cost of cleaning reflectors in dirty locations, especially in mill rooms with high ceilings, has made the use of reflector and projector type lamps very attractive. These lamps with built-in reflectors are rated at 1000 hours life, and the reflecting surface is just as clean at the end of its life as at the time of original installation. No cleaning is necessary, since the lamp is replaced by the time the outer surface is dirty enough to seriously obstruct the light output.

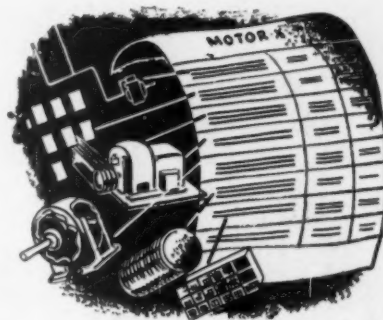
Know Your Costs

G. E. Meyers, Manager, Special Services, Eastern Div., Ernst & Ernst, Boston, Mass.: In one instance, a draftsman's swivel tray was made in the company's craft shops at a cost of \$37.71, whereas the identical tray could have been purchased for \$7.50. Two hundred wooden dowels cost \$64 to make, whereas the outside purchase price was 2c each, or \$4. In another instance, four trash cans were repaired at an average cost of \$5.08; identical cans can be purchased new for \$2.69.

To avoid such cases, a written order should be prepared for every request covering maintenance work,

and time-keeping procedures inaugurated so that the actual man-hour costs can be determined for each maintenance job. Orders fall into three classifications:

- A. Routine, blanket, or standing orders.
- B. Repair orders, covering jobs not exceeding 100 man-hours.
- C. Work orders, including major repairs or capital expenditures, involving costs of more than 100 man-hours.



Motor Maintenance

E. L. Happ, Maintenance Superintendent, Ecusta Paper Co., Pisgah Forest, N. C.: The amount of machine downtime is a measure of the efficiency of a preventive maintenance program. First essential of a good working program is a simplified record of the equipment.

Typical record card for a motor shows what feeder circuit it operates on, where it is, what equipment it drives, its size, construction, type of bearings, catalog numbers, stator coil number, how many coils per set, and control equipment. It also shows storeroom location of each spare part, and a history of the motor and any troubles experienced with it.

Some engineers can only see the original cost difference, and fail to consider differences in maintenance costs over a period of years. On a 10 hp motor general overhaul, it takes six hours less on a totally enclosed fan-cooled motor than on an open motor. It doesn't take long to justify the additional cost, especially when you add the cost of dipping varnish, drying out, and baking. Also, the open motor would be out of service much longer due to the extra operations. There are instances where several 10 hp motors could be purchased for what it costs to have one machine down for an hour.

A modern, well equipped maintenance shop can cut over-all maintenance cost by as much as 30%.



Everybody's happy. A modest investment in preventive purchasing saved this young man an eye and saved his company hundreds of dollars in accident claims and lost time.

PREVENTIVE purchasing is that combination of foresight and imagination that recognizes a need or an opportunity, and does something about it before unnecessary or avoidable costs have been incurred. Preventive purchasing is an attitude or approach to the job rather than any particular technique. It is characteristic of the man who is thoroughly familiar with the operations of his company, has a broad knowledge of purchasing and an active interest in learning more. For, while it is not strictly creative, it is a constant process of perceiving the value of creative ideas and putting them to work.

The savings made through preventive purchasing are not always measurable, since in many cases you are balancing actual costs against hypothetical costs or intangible possibilities. In other cases, however, a direct comparison can be made, and from these examples it is apparent

that preventive purchasing does not deal in pennies but in those substantial sums that make the difference between ordinary operations and really prosperous profits.

A \$20,000,000 Example

A striking example of the savings that can be achieved through the recognition of new ideas, and resultant preventive purchasing, was recently provided in the construction of the Metropolitan Life Insurance Company's vast Park La Brea housing project in suburban Los Angeles. This is a multi-million dollar enterprise. The need for housing was obvious; equally obvious is the fact that reasonable rentals and profitable income depend on keeping construction costs within limits.

This particular project demonstrates two stages of prevention. In the first place, apartment houses of the type contemplated, in that area, would normally be of reinforced concrete construction for the sake of permanence, as a precaution against California earthquakes, which can abruptly alter the longevity of many other types of structures. The investment in quake-proof construction is in itself an example of preventive purchasing, in which the saving is hypothetical and unmeasurable, though very real.

That's where an alert purchasing agent came into the picture. He saw fit to investigate reports that a

small group of western contractors had developed a technique for reinforced brick construction that was in some respects superior to the accepted concrete type, at costs ranging to as much as 25¢ per foot less. The new specification was adopted. Result: The original estimate of cost on the currently completed portion of the project was 60 million dollars. The actual cost totalled only 40 million dollars. In these days of notoriously high construction costs, this stands as a major purchasing accomplishment.

Adapting a Special Product

Dealing in smaller figures, yet showing proportionately greater savings, is the experience reported at the Minnesota Mining and Manufacturing Company's plant near Corona, California. It has to do with the prevention of cable breakage. In this case, the purchasing agent had the curiosity and initiative to investigate a new type of "bearing swivel" developed by the General Machine and Welding Works.

This device was actually originated to relieve torsional stresses in order to prevent the breakage of cables used in launching Air Force gliders. The P.A. wanted to find out whether they might be similarly useful in connection with the cables which manipulate a 5-ton demolition ball for breaking granite. Tests indicated that the new swivel application should be practical, and a bearing swivel was purchased for the

PREVENTIVE PURCHASING

By Thomas A. Dickinson

demolition ball setup. Result: the Corona plant saved \$900 on the cost of cables in an initial operating period of only three months, through elimination of breakage.

Adapting Tool Design

In many factories, preventive purchasing is a matter of ingenious opportunism. It is obviously impossible to save hundreds or thousands of dollars on each and every purchase order issued to meet standard production requirements. Nevertheless, Jack I. Gantz has managed to find the appropriate opportunities with amazing frequency in the years that he has been with Hydraulic Press and Manufacturing Company at Los Angeles.

Gantz's company specializes in the custom manufacture of machine tools. He has learned over a period of years that a custom tool design

identical castings made to special design was in the neighborhood of \$40,000. There was no specific, foreseeable need for the castings at the time of purchase, and they didn't exactly fit any drawings in the shop at the time, but the general type was in line with what the company could use.

Six months later, one of them was reworked for use on a new hydraulic press at a total cost of about \$1,000. Result: a saving of almost \$19,000 for the company and its customer, over and above the cost of both castings, one of which remains to be used on another project as the occasion may arise at "no cost", which is practically perfect procurement.

Savings in Operating Cost

The basic idea of preventive purchasing is to save money by spend-

sibility of putting these developments to work, frequently beyond the fields of application for which they were originally intended.

For example, the master tooling dock developed by Leland A. Bryant to serve as a universal assembly-jig master for the aircraft industry during World War II has many economical potentialities as a three dimensional positioner that have not yet been recognized even in very large factories that are most anxious to hold the line on product prices without a sacrifice of profits. This is partly due to the high cost of tooling dock installations, and partly to the general suspicion that aviation tools are not adaptable to other industries. Yet a number of concerns, including Brill Motor Corporation, have apparently proved that it can reduce tooling costs for many products—especially those which require a certain amount of streamlining.

The Brill organization is referred to on the basis of a recent tooling program, during which a master tooling dock was used as a positioner for both contour masters and assembly jigs or fixtures required in the manufacture of streamlined motor buses. It is revealed that the company's new dock installation halved the time normally required for tooling up, and repaid more than \$50,-



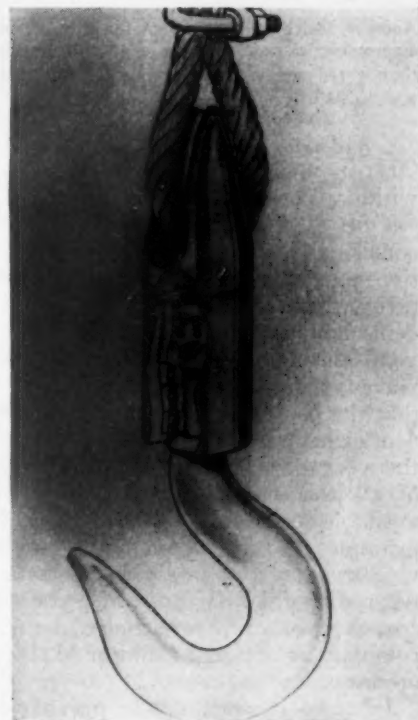
Metropolitan Life Insurance Company's Park La Brea housing project, where construction costs were cut one-third without impairing the buildings' resistance to possible quake damage.

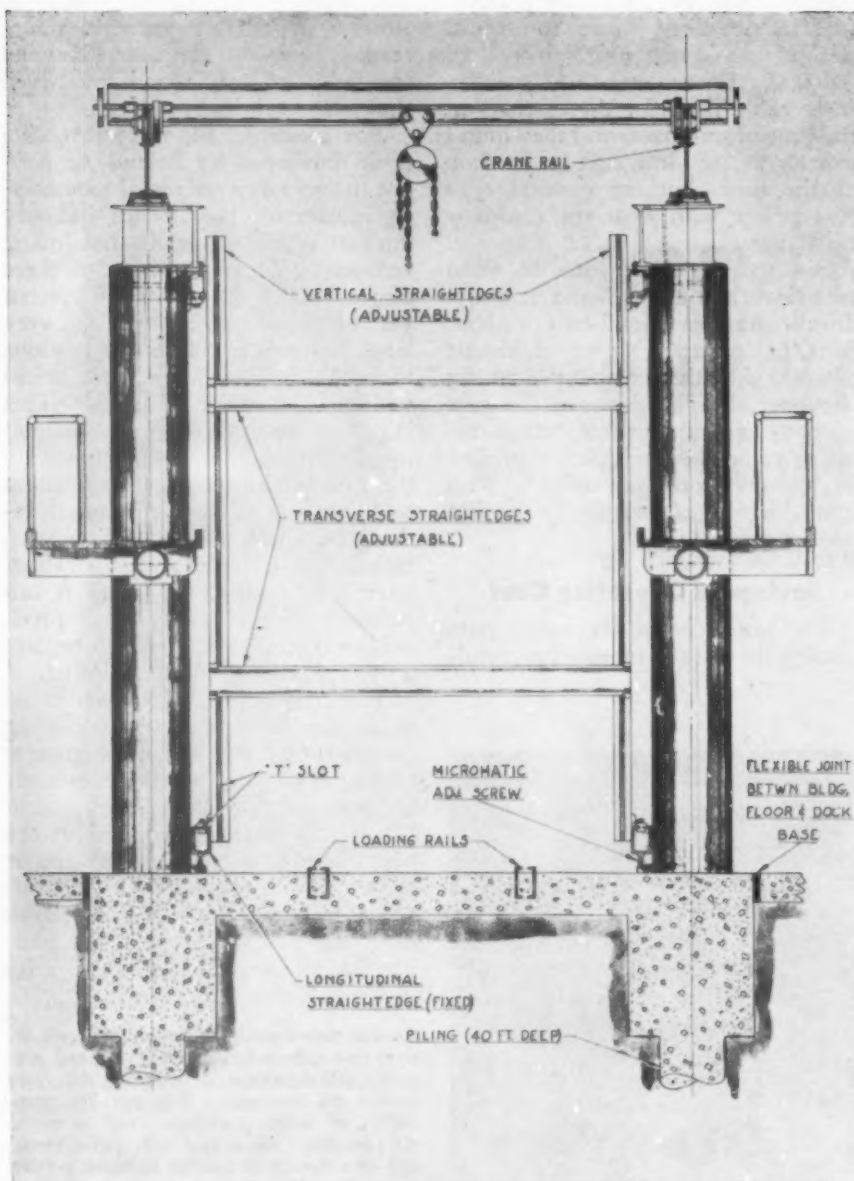
can be varied in many ways to make use of available materials without any sacrifice of quality. So, instead of awaiting engineering specifications before deciding exactly what should or should not be bought, Gantz keeps his eye open for bargains that show promise of profitable application, on the principle that the specific design can be adapted to make use of such materials acquired at favorable cost.

For instance, he recently bought a pair of undamaged but surplus steel castings at the scrap value of \$500. The estimated cost of the

ing. The practicability of such expenditures can usually be measured by the ability of a material or product to amortize its own cost in a specific period of time, plus the period thereafter during which savings or profits can be anticipated. Many special production tools must be purchased almost regardless of cost, to accomplish a necessary operation, their purchase price and amortization becoming a part of product cost. Industry is constantly developing new methods and equipment to reduce these factors. Preventive purchasing has the respon-

Bearing swivel designed for the aircraft industry to relieve torsional stresses and prevent cable breakage in launching Air Force gliders. An imaginative P.A. saw the possibilities of wider application, and is saving his company \$300 a month in cable breakage on a demolition ball for breaking granite.





Another device borrowed from the aircraft industry is the master tooling dock shown in this diagrammatic view. It's an expensive installation, but one motor bus manufacturer found that it reduced tooling up time by half and repaid more than \$50,000 in costs within six months of use.

000 in original installation costs within a period of six months.

One of the most desirable and consistently practical of all preventive purchases are those expenditures which reduce the rate of accidents among factory employees. Beyond the humanitarian factors involved, there is the well known fact that the cost of one substantial accident claim can amount to more than the cost of a complete assortment of all the safety devices that are available to modern factories. As an example: it costs about \$5 to provide a worker with a pair of shatterproof goggles, lack of which could cost the worker an eye and cost the company an accident claim of \$5,000 or more.

In most companies, the purchas-

ing agent's responsibility in respect to safety equipment is a secondary one. His concern with the matter starts when he receives a requisition at the instance of the safety engineer. His job then is to procure good safety devices that will provide the needed protection, at the lowest cost consistent with that protection. But in the smaller concern, safety is or should be a matter of great concern to every official, and the buyer has an opportunity to practice real preventive purchasing.

There are abundant statistics on the cost of industrial accidents. However, since few business men appreciate the distinction of having their accident problems publicly discussed in print, even after the problems have been solved, it is a bit

difficult to cite instances in which purchasing agents have saved their companies money by being safety-minded. However, one such instance can be related anonymously in the words of a P.A. for a metal products concern employing about 500 factory workers.

Eliminating Accidents at the Source

"I was checking over costs in our annual report," this purchasing agent recalls, "and noticed that the cost of accidents among our employees amounted to more than \$100,000 during the previous year. I wasn't surprised to learn that we had accidents, because a certain number of injuries of this type could be expected even in an old folks' home; but I was startled to learn that the cost was so high. So I decided to find out exactly where and why our accidents took place, and see if something couldn't be done about it from the purchasing angle.

"It wasn't a very difficult task. I simply checked the list of employees who were injured, and asked their foremen to tell me how the accidents happened. When the foremen answered my questions, they were themselves surprised by the realization that many of the accidents took place in identical locations and from identical causes. Apparently they hadn't been previously impressed, either because of the intervals between accidents or because they were accepted as a necessary evil.

"The highest ratio of accidents was accredited to our sheet fabrication department, and they consisted for the most part of cut fingers at the bandsaws. The conventional type of guard wasn't doing the job of protection that we needed. I spent quite a lot of time trying to find a suitable and effective safety device, without success, then did learn about a new type of bandsaw with file-like blades. It wasn't designed to keep operators' hands out of the danger zone, but the cutting action was such that it wouldn't seriously damage human flesh before the workers reacted to pain and got their fingers out of the way.

"Yes, of course we still have a few accidents, but they're not costing nearly so much in medical attention, claims, or lost time. What's more important, we are no longer taking it for granted that accidents are inevitable. We're finding out where and why they happen, and doing everything possible to see that they are not repeated."

*Not perfect—nor hopeless—but rich in promise
and reward to those who will work at it intelligently*

The American System is Worth Fighting For

By Grey Leslie

There have been many doughty champions of private enterprise and American capitalism in the lists of late. Capitalism has had whole battalions of stalwart defenders against hostile critics from both political left and right. But too many of the champions of capitalism in their zeal to proclaim its merits have ignored its problems. The average citizen or business man is left to find what consolation he may, in being constantly exhorted to be grateful for a system he knows too well has serious defects despite the confident assurances that all's well or soon will be, in our America under our American capitalist tradition.

Dr. David McCord Wright of the Department of Economics, University of Virginia, has made a formidable contribution to the defense against the adversaries of American competitive capitalism. In his book "Democracy and Progress" he has armed himself for this vital encounter with sane argument and compelling logic. He has brought to his task a lively spirit and an intellectual equipment refreshingly different from the usual apologists, both amateur and professional.

Instead of blind drifts so frequently concealed as the sovereign remedy for the economic ills from which we suffer, he has diagnosed the case calmly and thoroughly as a skilled physician and suggested a prescription which has large promise of cure.

Dr. Wright's thesis as presented in this book is much more than a technical study of current economic problems. It is a sane argument with flashes of penetrating brilliance. It proposes a flexible capitalism, capable of ready adjustment

to rapidly changing conditions at home and abroad. Nowhere in it, is there a plea for *laissez faire* and the good old days, nor for the retention or perpetuation of capitalism "as is" without some thorough reconditioning.

He has spent many years in "pure" economic analysis, and out of his rich experience he has concluded that "the man who wishes to avoid nonsense cannot study social policy on a technical level alone."

He makes it clear that economic processes involve much more than

A defense of private enterprise, capitalism, or any other system, must be based on value-judgments.

Retain Profit Incentive

The central thesis of this book is the generally familiar one that political democracy, as with all our liberties, depends largely on the preservation of the profit system; but he expounds his belief with far more sense and intelligence than most business propaganda. The competitive system, he says, is not in itself a guarantee of democracy and progress, but it is an overwhelming

A pre-Korean discussion of the economic problems of free enterprise sees both the ills and their cures as inherent in the system. But we must not drift; we must face the problems frankly and strive to make the system work even better or become vulnerable to the philosophies of planned economy that are incompatible with progress and opportunity. The new world conflict gives added significance to this study. We are indeed engaged in a battle for survival.

price systems, supply and demand, and other professional labels, and that economic analyses cannot possibly cope with the basic problems of economic life without full attention to the sentiments and attitudes which motivate them. Few older economists have made that discovery and many younger ones never will as long as "objectivity" and mathematical analysis are accorded the pre-eminence and prestige they now command in their present training.

necessary condition for them.

Private enterprise, his argument runs, is the system that has proved most favorable to scientific research, technological innovation and individual initiative, and is therefore the surest means to material progress. It provides alternative job opportunities for the worker—a condition given proper emphasis as essential to economic and therefore to political liberty; and one which involves not only avoidance of government or bureaucratic planning

boards but also drastic reforms in trade union policies.

The incompatibility of comprehensive planning and free enterprise is clearly demonstrated; for comprehensive planning through authoritative government agencies or commissions would reduce private business to an empty shell. It would put us under the regime of a self-perpetuating bureaucracy, which, by its inevitable antipathy and its opportunity for resistance to technological change and innovation, (since both would upset its precise calculation) and its discouragement of risk investment, would result in a stagnant economy.

In these general terms the argument is restrained, but familiar enough, and we might conclude that Professor Wright has only reiterated in a novel fashion the stereotyped propaganda of big business. Such an inference would be mistaken, however. The book may give equal pause to some who are ardent exponents of an Administrative State of greater or lesser scope, and on the other side, to many who are seriously worried by the warnings of Hayek of an invisible but powerful hand leading us step by step down the road to a fully regimented existence.

Capitalism Can Work Better

Much of the book is devoted to a critical consideration of well recognized economic issues—economic instability, income distribution, isolationism and tariff barriers, competition and monopoly, and the policies of organized labor.

But the case against comprehensive planning is conclusive. However, the "friends" of private enterprise who oppose *all* government regulation on principle are pointedly regarded as among capitalism's worst, even if unwitting, enemies. Professor Wright shares the opinion of many intelligent business leaders that the profit system can and must be made to work much better than it has in the past if it is to survive. In refusing to scrap it for streamlined experiments or what would appear to be attractive innovations, the author is keenly aware that the defenders of the capitalist system are charged with the tremendous responsibility to show what can be done to make its performance reasonably acceptable. But he is confident it contains the remedies for most of its present and flagrant weaknesses.

He contrasts two types of policy—the ultra-conservative with its tac-

it tolerance of private monopoly, its indiscriminate and often intemperate emphasis on drastic and unreasoning government economy, and its high-tariff and protectionist isolationism. The other, the ultra-liberal—even a policy of "guided capitalism" in its polite name, we may, for brevity's sake associate with the policies of the British Labor Party or extended Keynesianism in its extreme application.

Professor Wright does not support either platform.

Is Instability Inevitable?

The two main defects of capitalism are instability and monopoly. The chief aim of our anti-trust laws should be the preservation of technological creativeness and economic democracy—economic democracy in its full sense of fair competition, and full opportunity and protection for the small businessman. To overcome these main defects he advocates monetary policies to keep violent fluctuations within bounds; policies to provide credit facilities for small independent business firms sufficiently numerous to keep big business from becoming stagnant or oppressive; restriction of huge mergers by purchase, and finally, com-

plete revision of our patent laws.

Returning to the battlefield of comprehensive planning the author contends in his discussion of business cycles, that no planned economy can remove violent industrial fluctuations unless it is willing to discourage or hold back new inventions and refuse to satisfy consumer wants promptly. He asserts that in any economy in which growth and change are not discouraged or check-mated, a certain amount of instability is inevitable:

"An industrial society without a stabilization problem is likely to be an industrial society without economic freedom."

As long as there are new inventions, new products and the resultant changes in consumer demand, the forecasting essential to a planned economy would meet with insuperable difficulties. The price of stabilization would be too high—and it would be fatal to any real progress.

There are some logical differences involved in the author's handling of the moot question of Civil Rights and equality of opportunity in our country. He maintains that liberal equality anywhere is an anomalous concept. He leaves the exploration of that subject to the industry and

(Please turn to page 338)



"So our prices seem a little high—sure, but we haggle."

Trend of Business
As Seen In Current
News & Statistics

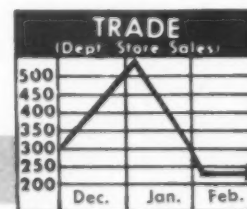
Where We Stand



	BASE	LATEST	MONTH AGO	YEAR AGO	% OF CHANGE IN	
					MONTH	YEAR
Industrial Production Index.....1935-1939=100	220	216	216	183	+ 1.8	+20.2
Steel Production (Weekly).....000 net tons	1,969	1,991	1,991	1,729	- 1.1	+13.8
Electric Power Production (Weekly).....mil KWH	7,099	6,602	6,602	6,062	+ 7.5	+17.1
Bituminous Coal Production (Weekly).....000 net tons	9,530	10,050	10,050	6,540	-15.1	+45.6
Auto, Truck & Bus Output (Weekly).....units	142,943	93,123	93,123	120,061	+53.5	+19.1
Petroleum Output (Weekly).....000 bbls.	5,861	5,710	5,710	4,883	+ 2.6	+20.0



	BASE	LATEST	MONTH AGO	YEAR AGO	% OF CHANGE IN	
					MONTH	YEAR
All Commodities (BLS).....1926=100	182.2	178.1	178.1	152.1	+ 2.3	+19.8
Farm Products.....1926=100	200.3	187.8	187.8	158.5	+ 4.4	+27.2
Metals & Metal Products.....1926=100	188.9	187.9	187.9	168.5	+ 0.5	+12.1
Building Materials.....1926=100	226.5	223.4	223.4	192.4	+ 1.4	+17.7
Steel Billets (Pittsburgh).....net ton	\$56.00	\$56.00	\$56.00	\$53.00	0	+ 5.7
Steel Scrap, heavy melting, Pitts.....ton	\$44.00	\$46.13	\$46.13	\$31.25	- 4.5	+40.8
Copper, electrolytic.....lb.	.24 1/2	.24 1/2	.24 1/2	.18 1/2	0	+32.4
Rubber (rib-smoked sheets).....lb.	.74	.70	.70	.19 1/4	+ 5.7	+284.4
Wheat, No. 2.....bu.	2.83	2.70	2.70	2.53 3/4	+ 4.8	+10.3



	BASE	LATEST	MONTH AGO	YEAR AGO	% OF CHANGE IN	
					MONTH	YEAR
Dept. Stores Sales Index (Fed. Res.).....1935-39=100	233	285	285	226	-18.2	+ 3.0
Commercial Failures (Dun & Bradstreet)....no.	159	144	144	199	+10.4	-20.1
Freight Carloadings.....cars	651,124	662,444	662,444	612,464	- 1.7	+ 6.3

FINANCE

Stock Prices (Standard & Poor's).....1926=100	175.4	168.3	168.3	136.6	+ 4.2	+28.4
Bank Clearings (New York).....mil \$	7,736	8,435	8,435	7,670	- 8.3	+ 0.8
Federal Reserve Credit.....mil \$	23,260	21,235	21,235	18,146	+ 9.5	+28.1
Currency in Circulation.....mil \$	27,125	27,415	27,415	26,985	- 1.1	+ 0.5

MANUFACTURERS' SALES, INVENTORIES AND NEW ORDERS

Value of Manufacturers' Sales
Seasonally Adjusted
(Millions of Dollars)

All Manufacturing	16,221
Durable goods	6,631
Iron and Steel	1,405
Nonferrous metals	399
Electrical machinery	736
General machinery (exc. elec.)	1,087
Motor vehicles & equipment	1,130
Transportation equipment (exc. motor vehicles)	324
Lumber and timber products	475
Furniture & finished lumber products	348
Stone, clay & glass products	406
Nondurable goods	9,590
Food and kindred products	2,624
Beverages	413
Tobacco products	272
Textile-mill products	1,033
Apparel	721
Leather and products	244
Paper and allied products	502
Printing and publishing	517
Chemicals and allied products	1,167
Petroleum and coal products	1,589
Rubber products	247

Book Value of Manufacturers' Inventories
Seasonally Adjusted
(Millions of Dollars)

All Manufacturing	r28,665
Durable goods	r13,204
Iron and steel	2,874
Nonferrous metals	963
Electrical machinery	1,489
General machinery (exc. elec.)	3,152
Motor vehicles & equipment	r1,670
Transportation equip. (except motor vehicles)	787
Lumber and timber products	550
Furniture & finished lumber products	582
Stone, clay & glass products	515
Nondurable goods	15,461
Food and kindred products	2,761
Beverages	996
Tobacco products	1,522
Textile-mill products	1,953
Apparel	1,236
Leather and products	517
Paper and allied products	669
Printing and publishing	551
Chemicals and allied products	2,074
Petroleum and coal products	2,247
Rubber products	526

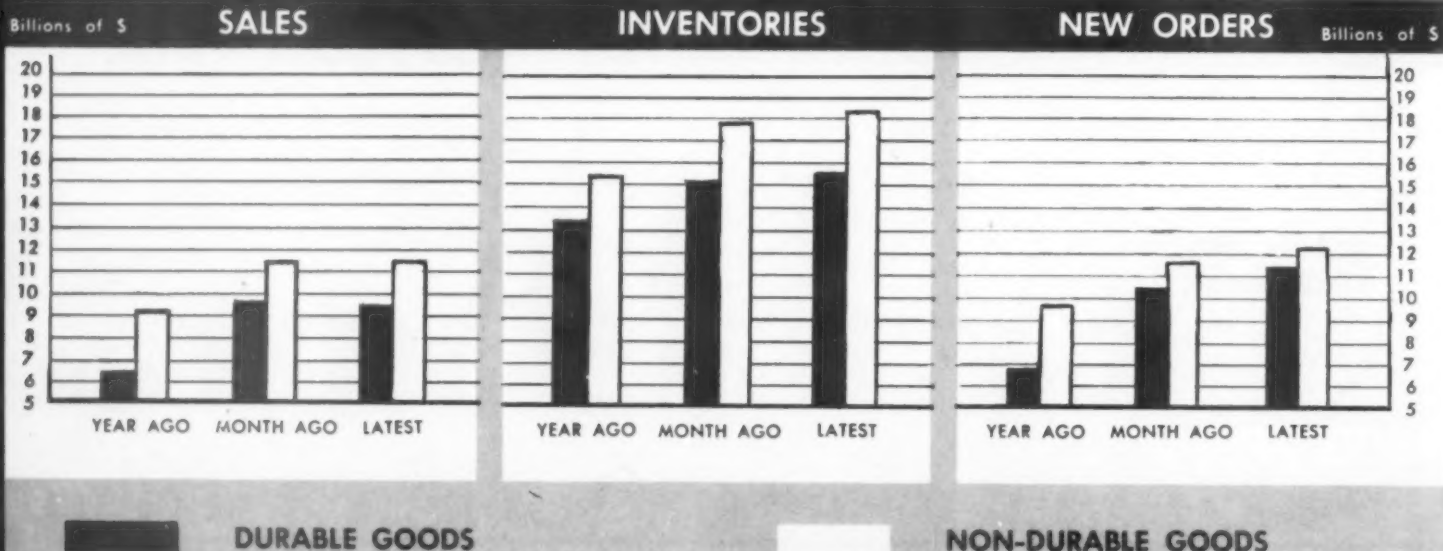
Manufacturers' New Orders (Unadjusted)

All Manufacturing	16,868
Durable Goods	6,941
Non-Durable Goods	9,927

	1949		1950			
	November	December	September	October	November	December
All Manufacturing	16,221	15,756	r21,154	r21,229	21,134	21,341
Durable goods	6,631	6,516	9,392	r 9,671	9,730	9,725
Iron and Steel	1,405	1,704	2,345	r 2,414	2,448	2,608
Nonferrous metals	399	406	591	r 599	610	630
Electrical machinery	736	676	1,116	r 1,131	1,108	1,059
General machinery (exc. elec.)	1,087	1,028	1,458	r 1,512	1,544	1,525
Motor vehicles & equipment	1,130	994	1,449	r 1,547	1,501	1,505
Transportation equipment (exc. motor vehicles)	324	319	379	r 401	402	399
Lumber and timber products	475	443	656	r 673	683	663
Furniture & finished lumber products	348	309	433	r 437	449	429
Stone, clay & glass products	406	358	513	r 542	566	528
Nondurable goods	9,590	9,240	r11,762	r11,558	11,404	11,616
Food and kindred products	2,624	2,496	3,038	r 2,972	2,949	3,223
Beverages	413	439	448	r 434	390	439
Tobacco products	272	248	261	r 271	282	269
Textile-mill products	1,033	965	1,354	r 1,293	1,290	1,250
Apparel	721	743	955	r 976	839	821
Leather and products	244	228	335	r 324	287	268
Paper and allied products	502	474	620	r 656	668	660
Printing and publishing	517	597	633	r 581	576	595
Chemicals and allied products	1,167	1,063	1,583	r 1,550	1,529	1,480
Petroleum and coal products	1,589	1,518	r 1,853	r 1,834	1,870	1,871
Rubber products	247	245	404	389	420	n.a.

r — revised n.a. — not available

SALES, INVENTORIES AND NEW ORDERS



PRODUCT DELIVERY INFORMATION

THAT a Purchasing Department record of the delivery time of the multitude of materials, components, machines and tools needed by industry, is becoming more and more imperative is evidenced by the increasing number of orders and regulations issued by the National Production Authority. Also, increasing shortages of production and MRO materials are being reported by the various NPA Industrial Advisory Committees.

Further, NPA officials state that military requirements for steel, copper, zinc and other important materials will be higher during the second quarter of this year. A material control program similar to the CMP of World War II is in the making, and NPA is also studying the issuance of MRO orders.

The growing shortages and complexities of Delivery Time are further attested by information received from manufacturers asked to furnish delivery-time data for use in this report.

A large manufacturer of electrical equipment and products states: "we can't give you the information you want on product delivery dates for the reason that we do not know what these are ourselves. We aren't even giving our salesmen a 'horseback' estimate on delivery dates because of material uncertainties. If we could get our allotment of copper, and aluminum, and if DO orders could be clarified, and if a materials priority system were invoked, then maybe we would know what to expect."

A large steel company states that it has had to allocate monthly tonnages to regular customers, and is not taking on new customers. "Defense orders are accepted and produced on the basis of lead time specified by NPA," writes the vice president in charge of sales. "I think you will find most steel mills are operating on a similar basis."

A manufacturer of tools, gages and precision instruments declared that "there are some products that could not be delivered within two years."

One of the large brass companies says, "We are unable to give approximate delivery time under conditions that exist today." And a large chemical company advises that "all products are on informal allocation and orders are accepted for shipment within thirty days."

Delivery time indicated in this report is based on information received from several manufacturers of identical products, and the time shown is the range of delivery time reported by them. It should be borne in mind that a DO rating is not assurance of prompt delivery, nor an immediate source of supply.

	STANDARD Products	SPECIAL Products	D.O. Orders
ALLOYS, STEEL			
HR alloy bars	21 wks	21 wks	21 wks
CD alloy bars	26 wks	26 wks	26 wks
Carbon tube rounds	30 wks	30 wks	30 wks

BALL BEARINGS			
Bearings	12-17 wks	18-25 wks	

BOXES			
Folding (no printing)		6 wks	3 wks
Folding — printed	4 wks	6 wks	3 wks
Bakery boxes	4 wks	6 wks	3 wks
Folding cartons		6 wks	4 wks
Candy boxes	4 wks	8 wks	4 wks

BRASS			
Sheet	13 wks		6-11 wks
Rod	13 wks		6-11 wks
Wire	13 wks		6-11 wks

BUSHINGS			
Bronze	22 wks		

CASTERS			
Casters and Wheels	.2 wks		1 wk

	STANDARD Products	SPECIAL Products	D.O. Orders
CASTINGS			
Iron	9 wks		
Aluminum	9 wks		

CHAIN			
Hardware	7 wks	7 wks	Prompt
Tire	3 wks	3 wks	Prompt
Roller	Stk to 17 wks	13-17 wks	Stk to 6 wks
Steel	10 to 12 wks		8 to 10 wks

CONTAINERS			
Containers (Can Co.)	3-4 wks	9 wks	
Stampings (Can Co.)	6 wks	9 wks	2-3 wks
Misc. (Can Co.)	2-4 wks		3-4 wks
Wood cleated fibre shooks		4 wks	4 wks
Food pails, wire handles	4 wks	6 wks	3 wks
Wooden boxes		6 wks	4 wks
Wooden box shooks		6 wks	4 wks

CRANES			
Traveling lift	38-40 wks	28-30 wks	28-30 wks

DIE CASTINGS			
Zinc		9 wks	4 wks
Aluminum		9 wks	4 wks
Tools, Dies, etc.		18 wks	9 wks

PRODUCT DELIVERY INFORMATION continued

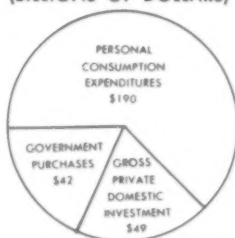
	STANDARD Products	SPECIAL Products	D.O. Orders
ELECTRICAL			
Motors	9-26 wks	17 wks	4 wks
Rigid conduit	30 wks		4 wks
ABC Cable (BX)	39 wks	6 wks	4 wks
Loomwire	17 wks		4 wks
Bldg. wire	26 wks	22 wks	6 wks
Outlet boxes and connectors	22 wks		4 wks
FIBRE PRODUCTS			
Vulcanized, .010-3/32"	26 wks	34 wks	13 wks
Phenol fibre	8-10 wks	10 wks	6 wks
FIRE PROTECTION			
Methyl Chloride	1 wk	2 wks	1 wk
Sulphur Dioxide	1 wk	1 wk	1 wk
Dry Chemical Extinguishers	3 wks	5-9 wks	2 wks
FITTINGS			
Welding Fittings	Stk. to 17 wks	22 wks	Stk. to 17 wks
Flanges	Stk. to 17 wks	22 wks	Stk. to 17 wks
FORGINGS			
Large	6-17 wks	12-26 wks	
FOUNDRY			
Riddles	2 wks	3 wks	2 wks
Sieves, Flour	3 wks	6-8 wks	2-5 wks
GEARS			
CI & CS cut & cast tooth	9 wks		7 wks
HOISTS			
Heavy Lift	20-24 wks	20-24 wks	20-24 wks
Hoists	Stk. to 13 wks	Stk. to 13 wks	Stk. to 13 wks
MACHINE TOOLS			
Grinders	9 wks	17 wks	4 wks
PIPE			
Wood lined pipe	3-6 wks		4 wks
Saran lined pipe	6 wks		4 wks
Saran tubing	Stock	4-6 wks	
Saran fittings	Stock	4-6 wks	
PIPE, STAINLESS			
S & Monel pipe	13 wks		6 wks
S & Monel fittings	13 wks		6 wks
PIPING, FABRICATED			
Fabricated	13 wks	26 wks	
Up to 500 tons		4 wks	Preference
Up to 300 tons		75 tons per mo	Preference
PULLEYS			
Cast iron	12 wks		9 wks
Welded steel	8 wks		6 wks
PUMPS			
Single stage 10" d. & below	13 wks	22 wks	13 wks
12" discharge-16"	18 wks	27 wks	18 wks
18" discharge and above	27 wks	36 wks	22 wks
Multi-stage standard	18 wks	31 wks	18 wks
Special, multi and vertical	52 wks	65 wks	52 wks
Turbine type	4-6 wks	10-12 wks	2-3 wks
Centrifugal	8-10 wks	12-16 wks	4-5 wks
RIVETS			
Tubular	8 wks	10 wks	6 wks
Split	4 wks	6 wks	4 wks
RUBBER PRODUCTS			
Cellular rubber	4 wks	6 wks	2 wks
Silicone rubber	8 wks	12 wks	4 wks
Foam latex rubber	13 wks	No spls.	4 wks
Rubberized Hair, Wood	6 wks	No spls.	3 wks

	STANDARD Products	SPECIAL Products	D.O. Orders
SAWS			
Hack saws	4-17 wks	4-26 wks	2-9 wks
Gas chain saws	3 wks	9 wks	2-3 wks
SCREW MACHINE PRODUCTS			
Screw Machine parts	13 wks		
SPRINGS			
Springs	13 wks	8-10 wks	6-8 wks
Cold rolled spring steel	17 wks		17 wks
SPROCKETS			
Sprockets	Stk to 9 wks	9 wks	Stk to 5 wks
Silent chain	Stk to 9 wks	9 wks	Stk to 6 wks
Woodruff keys	Stock	9 wks	Stk to 9 wks
STEEL			
Bars and billets	15-26 wks		
Plates and sheets	15-21 wks		
Nails	13 wks	13 wks	7 wks
Fence	13 wks	13 wks	7 wks
Barb wire	13 wks	13 wks	7 wks
Steel posts	13 wks	13 wks	7 wks
TOOLS			
Portable electric	3 wks	17 wks	2-3 wks
Flex. shaft equipment	6 wks	26 wks	5-6 wks
Hand measuring	4-17 wks	4-26 wks	2-9 wks
Precision instruments	4-17 wks	4-26 wks	2-9 wks
Dial gages	4-17 wks	4-26 wks	2-9 wks
Pliers	26 wks		17 wks
Wrenches	26 wks		17 wks
TRUCKS			
Fork	12 wks	16 wks	8 wks
Elec. lift trucks	12 wks	16 wks	8 wks
Hand lift	4 wks	10 wks	3 wks
Hand trucks	2 wks		1 wk
Trailers	10 wks		6 wks
Ind. wheels	2 wks	13 wks	6 wks
TIRES AND TUBES			
Industrial	2 wks	4 wks	2 wks
TUBING			
Welded steel	13 wks		9 wks
Welded Stainless	26 wks		9 wks
VALVES			
Brass valves	2 wks	3 wks	1 1/2 wks
Iron valves	1 1/2 wks	2 wks	1 wk
Cast steel valves	1 1/2 wks	2 wks	1 wk
Forged steel valves	1 1/2 wks	2 wks	1 wk
Stainless Steel	17-26 wks	17-28 wks	13-17 wks
WASHERS			
Washers	3 wks	3 wks	2 wks
Lockwashers	2 wks	9 wks	2 wks
WIRE PRODUCTS			
Music spring wire	8 wks	12 wks	6 wks
M.B. spring wire	26 wks		6 wks
H.C. rope wire			9 wks
Brush wire	9 wks	13 wks	6 wks
Industrial wire cloth	4 wks	9-10 wks	9 wks
Fabricated WC products		10 wks	6 wks
WIRE ROPE & CABLES			
Wire rope	2 wks	11 wks	13 wks
Elec. wire and cable	4 wks	13 wks	13 wks
Aircraft cord	4 wks	9 wks	4-9 wks
Aircraft cable wire	13 wks	22 wks	9 wks

STRAWS IN THE TRADE WIND

● This country's gross national product — the market value of goods and services produced — increased in 1950 to a total of \$280,000,000,000, according to the Department of Commerce. This is a rise of \$24,000,000,000 or 9.5% over 1949. A 7.5% rise in production, coupled with a 2% rise in prices was responsible, the department states. Although mobilization due to the Korean war had a strong effect on production, it was not wholly responsible for the rise. An increase of business of "considerable strength and breadth" was already occurring at the outbreak of hostilities, according to

**GROSS NATIONAL PRODUCT
1950**
(BILLIONS OF DOLLARS)



the department, and the war only added to "this already expansionary situation." Manufacturing registered the largest increase in income, reaching \$72,500,000,000 during the year. Full impact of the new defense program is not

reflected in the figures on Government purchases of goods and services, which show a decline for 1950.

● The National Industrial Conference Board's latest business analysis forecasts little increase in the total output of goods and services during the first half of 1951. Over the short run, it is pointed out, heavy industrial expansion, could take more out of production than it will add. The best example is the steel industry, now expanding rapidly, which might require during the next six months more steel than it could add to total national production. Stepped up military spending, the board report says, might cause a drop of from 15% to 20% in civilian goods and services.

● The Defense Production Administration is making available a \$10,000,000 fund to encourage explorations for strategic and critical metals and minerals in U. S. and territories. The Department of the Interior will make the contributions on the basis of half the cost. Repayments would be made from net royalties on the essential metals, which would go into the defense program.

● Officials of a Clinton, Iowa steel company have applied for a \$100,000,000 loan from the Government to build a plant on the Mississippi River at Comanche, Iowa. The plans call for production of 1,000,000 tons of finished steel and 400,000 tons of pig iron annually. The company expects to make sheet, bar and slat steel directly from iron ore.

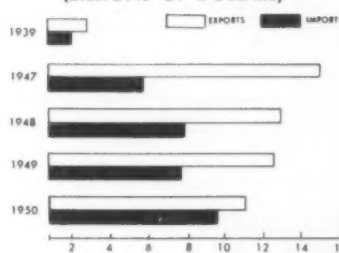
● Weirton Steel Company, a subsidiary of the National Steel Corporation, and operator of the world's largest tin mill, claims to have perfected a tinplating process that will save from 25% to 50% of the amount of tin

ordinarily used. "Electrolytic tinplate made with the new method" stated Thomas E. Millsop, Weirton president, "is plated on one side with the amount of tin coating necessary to protect the contents of the tin can and on the other side with only the amount of tin coating needed to protect the outside of the can from exposure." He added, "Weirton's plan will break the bottleneck in this vital metal and make it possible for Washington to revise its production schedules." Use of tin in the tinplating industry has been cut back 20% in the first quarter and 30% in the second quarter.

● New alloy steels, leaner in alloy content than the National Emergency steels of World War II have been announced by the Technical Committee on Alloy Steel of the American Iron and Steel Institute. The new steels employ very small quantities of the critical alloying elements nickel, chromium and molybdenum and are treated with a non-critical alloy containing the element boron, of which there are unlimited supplies in the U. S. Two series of steels have been developed for practically all the engineering and constructional purposes for which standard alloy steels are used.

● The current shortage of freight cars—estimated at about 23,000 cars a day compared with 300 a day during 1950 — is seriously endangering the defense effort, according to James K. Knudson, Defense Transportation Administrator. The crisis won't be solved, he stated, "unless 300,000 new cars are obtained as fast as possible." He said that the shortage could not be overcome.

IMPORTS AND EXPORTS
(BILLIONS OF DOLLARS)



He urged shippers to cooperate with railroads in making the best use of what cars are available, even though it meant paying overtime.

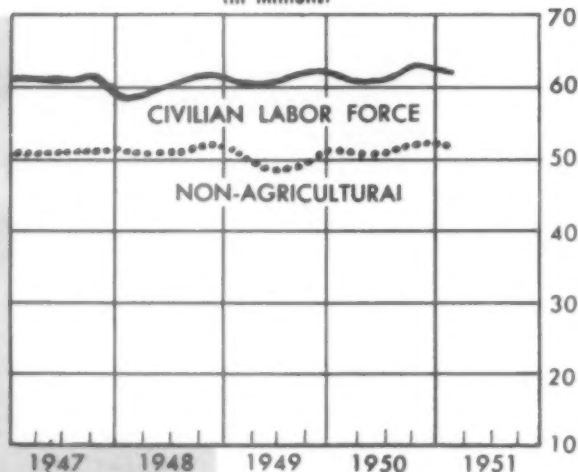
● United States exports in 1950 dropped, and imports climbed during 1950,

according to the Bureau of the Census. Shipments to foreign countries totaled \$10,274,800,000 in the year, a decline of 15% from the \$12,051,100,000 1949 figure. Imports in 1950 were valued at \$8,839,800,000, as compared with \$6,622,400,000 in 1949. Exports during December, 1950, were the highest since June, 1949, with the emphasis on machinery and vehicles.

● Utility sales of gas to ultimate consumers reached an all-time high of 4,654 million therms in December, 1950, the American Gas Association reports. This represents an increase of 24.4% over the 3,741 million therms sold in the same period in 1949. Natural gas sales showed the greatest gain, aggregating 4,316 million therms in December 1950, an increase of 26.7% over 3,407 million therms sold a year earlier.

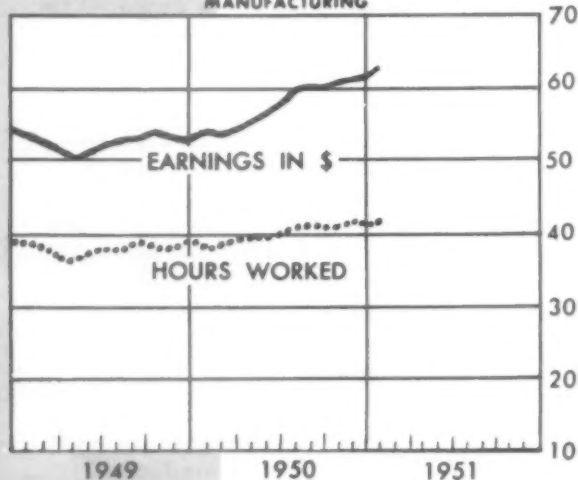
THE PULSE OF BUSINESS

EMPLOYMENT
(in millions)



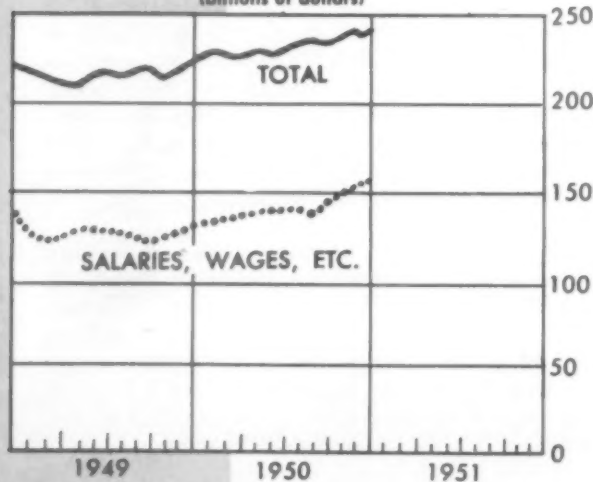
Source: Bureau of the Census

AVERAGE WEEKLY EARNINGS AND HOURS
MANUFACTURING



Source: U.S. Department of Labor

PERSONAL INCOME
(billions of dollars)



Source: U.S. Department of Commerce

The struggle to stabilize has been growing in intensity but not in clarity. While the actual machinery in Washington has been set up and apparently fairly well coordinated, the wage-price "freeze" announced last month seems to be compounded of such thin ice that it has not put to rest many doubts and fears. The consumers fear the price rises that will be permitted, business fears the prospect of runaway materials and labor costs under the "flexibility" provisions of the Government's policy, labor fears its allowable pay rises won't match the rise in cost of living, and officials apparently fear stepping on anybody's toes, even where it is necessary — notably in the case of agricultural prices. The bully of inflation appears to be taking over the block while the cops are off somewhere practicing for a parade.

The economic indicators on these two pages, both separately and collectively reflect the inflationary trend. More and more people are working — although the switchover from "peacetime" to "war" production is causing some disruptions in employment — and they are working longer and making more money for it. The rise in hours worked and in earnings was especially noticeable in durable goods industries, according to the Bureau of Labor Statistics. Personal income, too, is on the way up, having set a record high in December for the fourth straight month. The Commerce Department says the rise was due to large payments of corporation dividends, including "numerous extra and special payments", and to expanded factory and military pay rolls. Upward movements in all these sectors are expected to continue. A formula allowing wage rises of 10% has already been proposed, and rejected by labor, and there is more likelihood of that figure being revised upward than remaining where it is.

Rising prices are both a cause and an effect in the cycle. Bidding for scarce materials, for goods, has been driving price and cost-of-living indexes to new highs. Stabilization at some new higher level is not officially expected until at least the summer. Both Economic Stabilizer Johnston and Price Stabilizer Di Salle have forecast general price rises of from 5 to 10 per cent. Labor's reaction to such prospects has been to threaten more strikes if wages are not adjusted to meet the rising prices. Yet increased wages mean increased costs—which usually means increased prices. They also mean an increase in personal income. Which, if there is any left after the necessities of life have been taken care of, is generally used to purchase those goods that will grow scarcer as the defense effort grows greater. That also pushes prices.

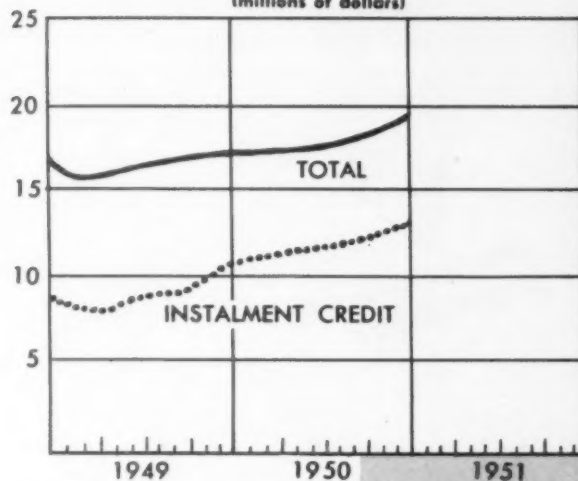
Easy credit has always helped fan the inflationary flame. The present situation is one of the best illustrations. Both consumer credit and bank credit are spiraling, and there is talk of greater restrictions. The Federal Reserve Board brakes put on consumer credit this fall were apparently not enough — auto loans have dropped, but the overall total has continued to soar. And while commercial credit leaps forward, the country waits to see the outcome of the controversy between the Treasury — advocates of "easy credit"—and the Federal Reserve, which is supposed to check it when inflation threatens. The President has taken

the side of the Treasury, but the Reserve Board may obtain from Congress greater powers than it now holds.

"Failure to tax — and tax hard now — will be perilous to our country's strength and safety" was the warning issued by Stabilizer Johnston in asking for immediate action by Congress on the President's call for additional taxes. But Congress was taking its time, and showed a disinclination to rush into accepting administration proposals. There was no denying that taxes were important — primarily for paying our way in the present crisis, and also for acting as a drag on inflation—but it was felt there were other means of raising — or saving — money than those proposed by the administration. There is definite, and widespread, sentiment, for instance, for a retail sales tax. The catch is, that despite agreement on its money-raising and inflation-checking value, it is politically a hot potato.

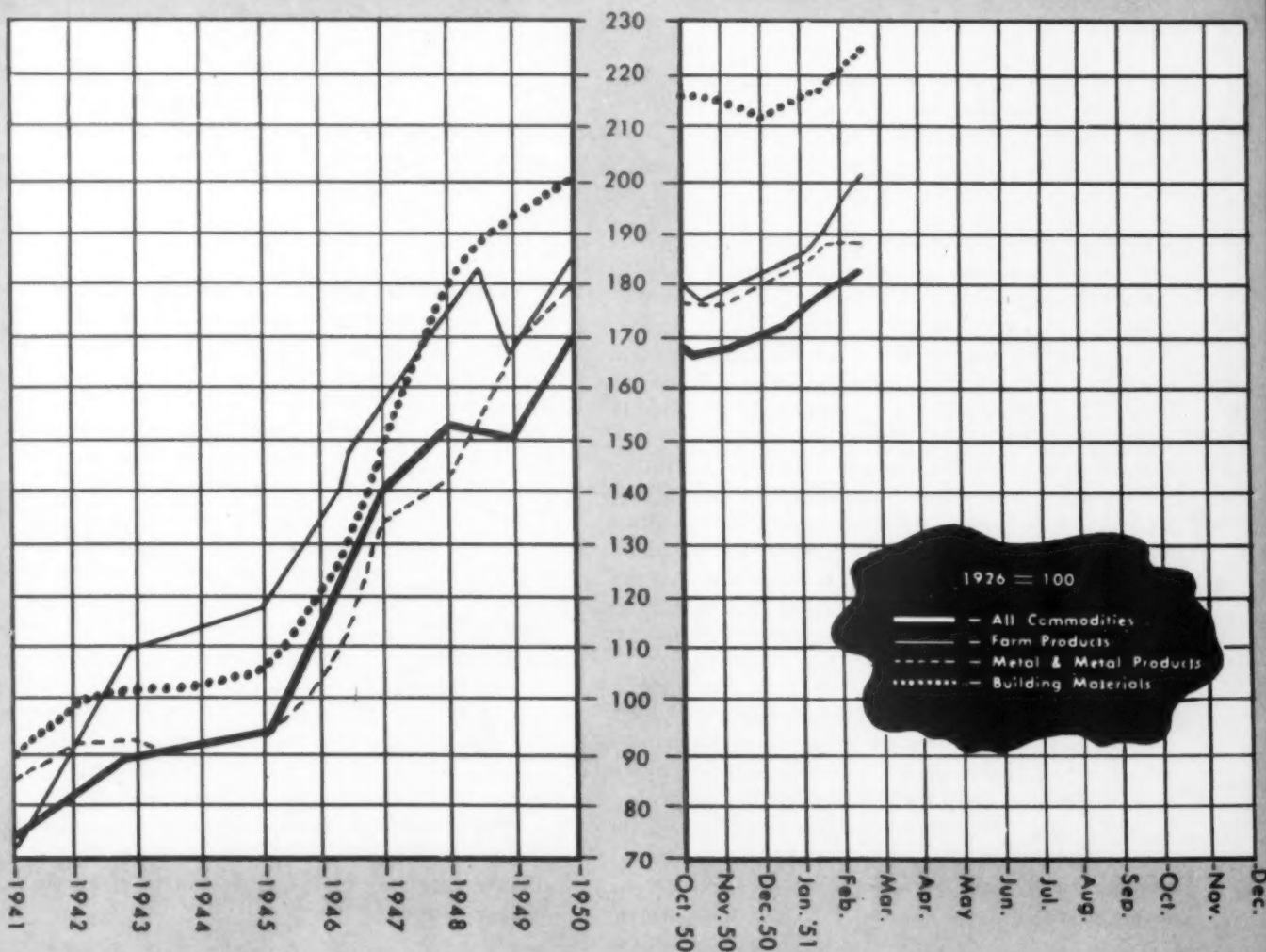
CONSUMER CREDIT

(millions of dollars)



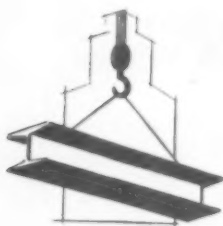
Source: Federal Reserve Board

THE PRICE PICTURE



MATERIALS AND MARKETS

STEEL: The railroad strike was a blow to steel production that might have passed relatively unnoticed in normal times. But the estimated loss of 200,000 tons at this time of national emergency and extreme shortages was anything but helpful. By the time this appears it is expected that the rate will be back to the 100% or more of capacity level with output exceeding 2,000,000 tons weekly. Defense orders continued to cut into this record production.



One producer reported that from 35% to 40% of its current plate orders have governmental priorities. "It is inevitable that these orders will increase and the use of steel plate for civilian purposes will decrease further" it was stated. Heavy demand for plates has been affecting the product-mix of many mills, forcing the diversion of steel that ordinarily would go into other products. Sheet and strip, too, are taking steel otherwise intended for different products. In spite of this tremendous pressure there still has been no definite indication of how much the military is eventually going to require for its program. Those steel buyers now suffering from shortages and from inability to get defense rated material wonder where it will all end. The latest commodity report of the New England Purchasing Agents Association, speaking of cold rolled strip says "it is a mystery where all the steel is going with big mills running at capacity. There must be large inventories somewhere — an inventory restriction order would smoke them out."

Added to, and directly related to, the uncertainty over defense requirements is the anticipated NPA 40% cutback in steel for the automobile and appliance industries. The industries involved are worried over production and unemployment, and so are the industries that depend on them. On the other hand, some steel sources believe the defense effort is not sufficiently prepared to absorb the heavy tonnage that would more or less suddenly become available, and that confusion, inequities and unemployment would result. Steel producers, conferring with NPA officials recently said that any reduction materials for durable goods manufacture should be made progressively in small amounts and that the free flow of "conversion" steel should be protected to prevent a "substantial loss of production."

NON-FERROUS METALS: Demand still runs ahead of supply in almost all the most important non-ferrous metals. Severe shortages in both copper and zinc have resulted in sharp cutbacks in leading brass producers' plants. Although the outlook offers little hope of relief, trade circles are reported to be questioning the need for the stringent regulations on use of non-ferrous metals already put into effect by NPA. As in the case of

steel, the expectation that auto and appliance production will be cut deeply in the near future, is causing some uncertainty. Both industries are large users of non-ferrous metals, and their cutting back would have a noticeable effect on supply... Latest NPA regulations limit inventories of lead and antimony to a 60-day supply or practical working minimum... Both manganese and tungsten ores have been placed under strict allocation... NPA Order M-12, Amended, has placed greater restrictions on use of copper for some civilian purposes, but eased others, notably on use of the metal for hot and cold water tubing in home construction.

FUELS: As expected, bituminous coal prices, reacting "partially" to the wage rise granted the U.M.W.A., in Pennsylvania, Ohio, and northern West Virginia were raised 20 to 35 cents a ton as of February 1. Anthracite prices were boosted 90 cents a ton. Both moves were permitted by the Office of Price Stabilization to cover higher costs. Bituminous producers, in notices to the trade, indicated that for the most part, the price advances would not fully cover costs of the wage rise... Domestic crude oil production has reached record proportions, at this writing having gone over 6,000,000 barrels daily for several weeks. The amount of crude oil being processed has been put at 6,500,000 barrels daily, the difference representing imported crude. Little fear is felt that supplies of petroleum products will be pinched by military demands in the immediate future. Defense demands are expected, of course, to continue mounting. But at present all signs indicate that, short of a "bigger war", the industry can take them in stride and still meet civilian needs.

CHEMICALS: A National Production Authority official has stated that the agency is planning to issue a general "over-all allocation order" on chemicals, some time during March. Charles C. Concannon, of the agency's chemical division stated that sulphur and sulphuric acid would be the first chemicals to be affected, with other scarce chemicals being covered later. Benzene, chlorine and the alcohols are other prod-

ucts the trade expects will be included shortly thereafter. It is believed that the general order will limit the amount of scarce chemicals a manufacturer will be entitled to, based on the essentiality of the product into which they are going. The order presumably would be similar to World War II's M-300 which strictly controlled distribution of chemicals

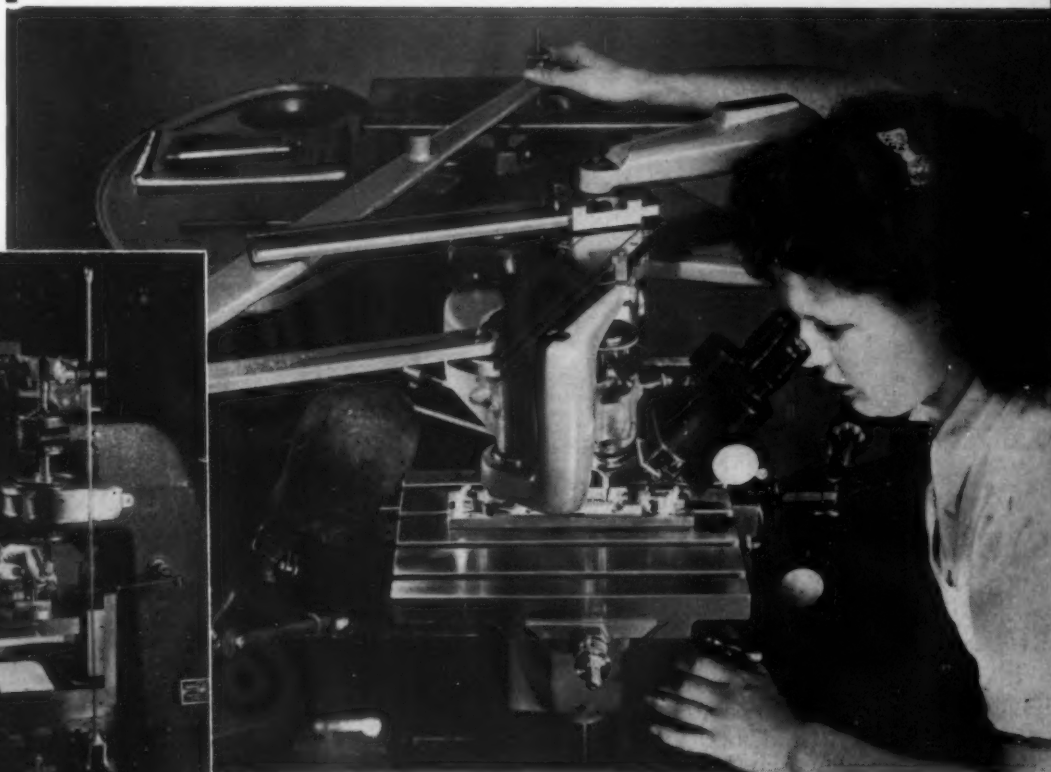
... Severe shortages continued in the chemical market throughout the month, with little prospect for relief as defense requirements cut more and more deeply into available supplies.



*More than
meets the eye*

Super-Seeing in Industry

*Photographs by courtesy of
American Optical Company,
Bausch & Lomb Optical Com-
pany, RCA Engineering Prod-
ucts Department, National In-
stitute of Health, Allis-Chal-
mers Mfg. Company, and E.
I. du Pont de Nemours &
Company.*



Microscopes on the production line—drilling holes in a watch escapement, and engraving numerals on a critically ruled instrument scale.

By Benjamin Melnitsky

OPTICAL microscopes are essentially mechanical eyes wearing powerful spectacles. Depending on the number, quality, and design of the lenses, and on the construction of the microscope itself, this instrument can see objects with a magnification up to 3,000 times greater than life size. A strand of human hair, so magnified, takes on the proportions of a giant redwood tree.

The optical microscope has many useful applications in industry where enlarged images of objects are to

be viewed on the job. Thus in the machine shop of the National Jet Corporation, where minute holes are drilled in a watch escapement, the entire fabrication process is viewed by the operator through a stereoscopic shop microscope. With her implemented vision, the operator checks the drill constantly for "wobble" caused by too great pressure or inexact alignment. In another plant, the setup on a high precision slitting saw for the production of lathe collets includes a microscope mounted horizontally to face the

cutting tool. On hundreds of production lines, these optical aids are an integral part of machines which work small parts to close tolerances.

Elsewhere, the microscope serves a wide variety of inspection and testing operations. Smaller 40-power shop microscopes, with self-contained light sources, and with engraved scales visible through the viewer, measure diameters of small holes, inspect metal surfaces, examine welds and electroplated surface finishes, and perform other useful functions.



Setup for photomicrography, using laboratory type microscope.

Powerful as its vision may be, the microscope sees much yet neither knows nor recalls anything. To be of any value, the light message it transmits must impinge upon the nerves and brain of the human who peers through the eye-piece. Photomicrography, the process which utilizes the microscope plus a camera, adds to the mechanical eye a photographic film brain on which images are permanently recorded.

This has been developed not only with the conventional microscope used with visible light rays, but also with the ultraviolet and electron microscopes.

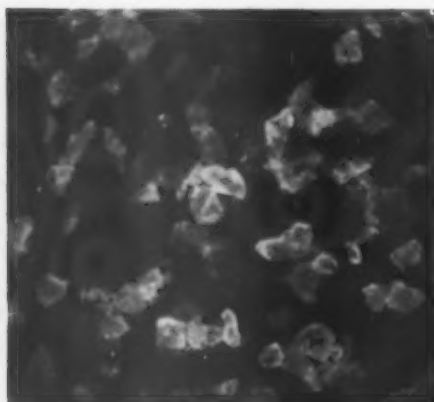
One could not even begin to catalog the superiorities of the human mind over inanimate photographic film; however, there are some superiorities in the other direction. To be realistic, it must be conceded that humans forget or recall imperfectly,

whereas the film record, in this respect, is close to infallible. Furthermore, with amazing agility, the eye sees what the mind dictates. The research scientist who wishes desperately to see a perfect alloy through the microscope may see a vision of flawless beauty in a faulty metal structure. Not so the impersonal, unbiased, untemperamental, thoroughly honest camera.

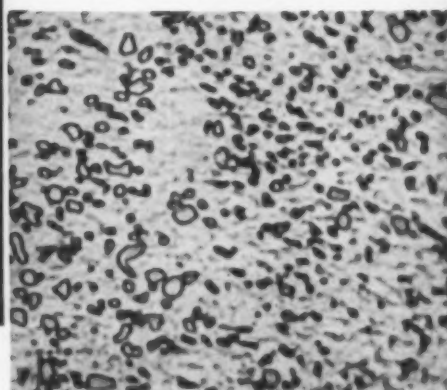
Also, it is obvious that direct viewing of a specimen limits the number of possible observers. Recorded on film, the image can be seen by all interested parties. Photomicrographs provide a convenient, sensible means for comparison, an objective record, and incontrovertible evidence.

Even more significant is the fact that the camera with fine-grain film actually sees more than the human eye. Photograph a freshly machined shaft with an ordinary camera, develop the film, and then "blow up" the recorded image with a photographic enlarger, and details will become apparent that would be undetected by the human eye, even with perfect vision and aided by magnification through a microscope. Technically, the film has a superior resolving power which is defined as "the power of discrimination between two minute objects that lie very closely together." Hence, when the camera replaces the human eye at the microscope viewer, the power of the microscope is greatly increased. In the case of the electron microscope, direct magnifications of 30,000 diameters are obtainable; photographic enlargements of the

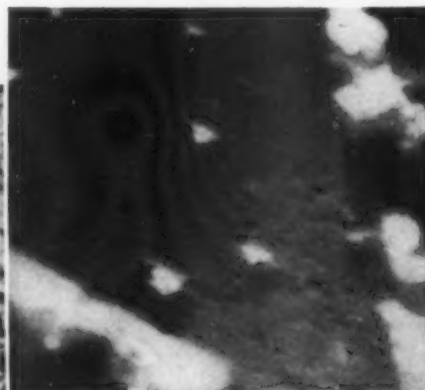
Photomicrographs of representative industrial materials



Sheelite ore



Tool steel—spheroidized cementite



Diamond—rough face



Setup for mineral analysis by ultraviolet ray photography.

original image bring the power of the microscope up to 200,000 diameters.

Another reason for using the mechanical brain of the camera is based, strangely enough, on an inherent limitation of photographic film. The normal human eye is sensitive to all colors on the visible spectrum from deep red to darkest purple, but cannot detect infrared or ultraviolet light. Thus all light rays

measuring from 400 to about 700 millimicrons (a unit of measurement equivalent to 1/254 millionths of an inch) are visible to the human eye. This is not true of many types of photographic film, which are usually more sensitive to one portion of the spectrum than another. Some films can "see" in the infrared or ultraviolet sections of the spectrum. In addition to the spectral selectivity of film, color filters can be placed

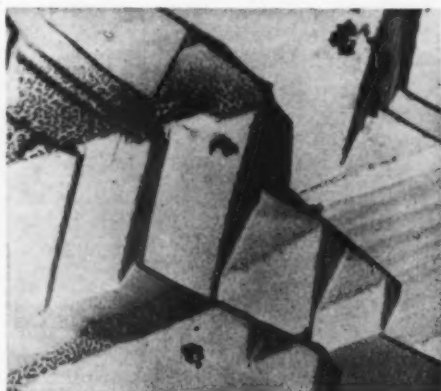
over the lens to further define this selectivity.

One example of how this control over color can be put to useful service is the protographic analysis of sheelite, a fluorescent tungsten ore. Under ultraviolet light, the crystals containing tungsten glow blue, while the crystals of the molybdenum impurity glow yellow. By studying a color photograph taken by the camera mounted over the microscope, it is possible to determine very closely the relative percentages of tungsten and impurity in the ore. The mineral sample, in powder form, is placed on the top surface of a plastic cylinder, and the camera is focused with ordinary white light. Then two mineral lamps are positioned beside the microscope, directing rays of invisible ultraviolet light on the specimen. Thirty hours are required to record a satisfactory full color image on the film. This color selectivity is used wherever factors invisible to the non-discriminating human eye need to be viewed.

Industrial Applications

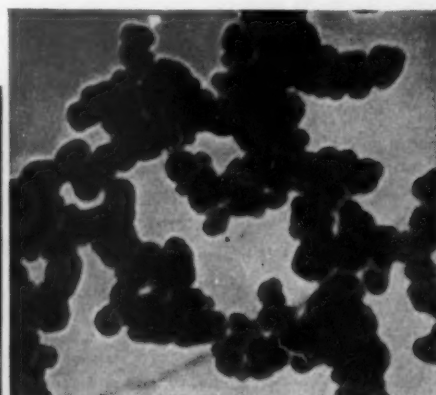
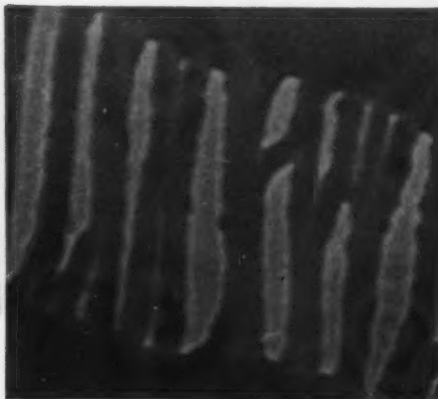
For these and other reasons, the camera-microscope combination enjoys extensive use in a wide range of industrial applications. Most common of these is metallography—the examination of metal surfaces which have been polished and etched. In essence, the science of modern metallurgy is founded on photographic recording of metal crystal changes brought about by annealing, carburizing, and other types of heat treatment, cold working, fatigue, hot working, and other forces.

The electron microscope, too, is



18-8-5-Mo Stainless Steel

Polystyrene



Lamp black carbon

far from being merely a high priced gadget with which the men of science can satisfy their collective curiosity about hitherto invisible vistas. It has contributed notably to our knowledge of tuberculosis, syphilis, the common cold, and other significant medical problems, through the study of virus, bacteria, and other invisible biological matter.

plastics, clays, ceramic materials, and other materials of industry. Such investigations have led to product improvements through greater knowledge of surface and internal characteristics of materials.

There are some differences and limitations, as compared with the optical microscope, which necessitate important variations in techniques

must penetrate the specimen so that an image may be recorded on the film or on a fluorescent viewing screen. This would preclude the study of dense substances were it not for several "replica" techniques which have been developed. In the most common of these, the metal surface is etched and then coated with collodion, silica, formvar, or some similar material. A reverse replica of the surface contours is thus formed on the collodion film, which is placed in the electron microscope for examination and study. In another technique, polystyrene is molded at high pressure on the surface to be examined. After being stripped away, the plastic replica is placed in an evaporating chamber and a thin layer of quartz evaporated on its surface. The thickness of the replica varies in accordance with the surface, and the electrons passing through the replica are affected in varying degree depending on the thickness. Hence the image projected is a true picture of the contours of the metal surface.

Inside Information

The conventional electron microscope examines the surface of substances. By use of an electron diffraction camera, the microscope can be adapted to study interiors as well. Photographs taken by this camera look like the "midnight sun". There is a diffused circular center surrounded by spaces of light at unequal distances apart. By mathematical means, the distance between circles and the appearance of the diffraction pattern serve as clues to the arrangement of atoms in the molecule. Thus these patterns can be used in the study of molecular structures, determining unknown materials by comparing them with patterns obtained from known materials, and detecting the presence of impurities which are indicated by "extra" lines on the electron micrograph.

An inherent shortcoming in the electron microscope is the weakness in the penetrating ability of the electron beam. It does not seem likely, at present, that thick specimens will be studied under this type of equipment. For this and other reasons, science has been giving considerable thought to the X-ray microscope. Major difficulty is that these rays cannot be concentrated by optical lenses, magnets, or other means tried to date; however, recent studies using specially designed mirrors have produced promising results.



Console model of an electron microscope.

It has also aided materially in the fields of chemistry, metallurgy, textiles, foods, petroleum refining, and others. Considering the relative newness of this instrument, progress to date is indeed remarkable.

Electron micrographs have been used to study such industrial processes as the setting of cement, action of catalysts, chemical changes during photographic development, and others. James Hillier, one of the men responsible for the development of the electron microscope, believes that the study of processes "will eventually become the most important application of the electron microscope in chemistry."

Equally significant is the work being done now in studying the structure of fibers, rubber, pigments,

and procedures for handling specimens. The electron beam and the material under examination are enclosed in a vacuum chamber; hence, materials which will disturb this air-free state cannot be studied directly. Since the electron beam is directed at high speed through the specimen, considerable transformation may occur in the object under study. The specimen must be extremely small and thin to fit in the $\frac{1}{8}$ " wire mesh work holder. The aperture is only $1/10,000$ as large as that in a light microscope. These and other limitations preclude many potential uses for this new instrument; however, the limits are gradually being lifted as continuing research broadens the scope of use.

The electron beam, ordinarily,

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N-A-X Alloy Division, Ecorse, Detroit 29, Michigan

NATIONAL STEEL



CORPORATION



ANALYZE YOUR JOB

● By Eugene S. Page

Director of Purchase, Great Lakes Carbon Corporation, Chicago

THE Director of Purchase must strive to lower the cost and improve the efficiency and performance of the purchasing operation. This is the basic part of his job.

The purchasing operation includes both the commodities and services which are purchased, and the actual function of buying. That is, it consists of:

Purchase Requirements, for operation (raw materials, supply materials, and all other operating commodities and services) and for capital expansion (commodities, construction, and services).

Purchase Functions (policies, procedures, and forms).

With respect to requirements, he can evaluate the job to be done and the standards of performance by attention to the following:

Specifications

1. Are they complete, descriptive, specific, and accurate?
2. Are reasonable minimum and maximum physical and chemical characteristics defined?
3. Are they the minimum to meet his company's particular requirements?
4. Do they describe a product readily available from industry?
5. Is a specific performance required, with guarantee?
6. Is the commodity specified the one best suited to serve the purpose for which it is intended?
7. Are any substitutes acceptable and available?
8. How are the specifications restricted by requirements of the company's customers?
9. Do they include qualities and designs adopted as standards by industry, government, or technical associations?

10. Have they been adopted by one or more product divisions of the company as a standard for purchase?

11. What are the provisions for measurement, sampling, inspection, and testing at destination?

12. Taking all the above into account, is there any way in which the specifications can be changed or improved to permit of more efficient and more economical purchase?

Quantities

1. What are the quantities required for consumption and inventory, now and in the future?
2. Are they firm or tentative?
3. Are these quantities favorable for economical purchase, shipment, and handling?
4. What is the inventory policy?
5. How may quantities for more than one plant, or more than one product division, be combined to advantage?

Destination

1. What are the facilities for inspection and testing; for unloading, handling, and storage?
2. Would a change or improvement in these facilities operate to advantage from the purchasing viewpoint?

Purchase

1. Has the market been thoroughly analyzed recently from the viewpoint of price and production trends, sources of supply, and local competitive situations?
2. Is every possible opportunity being seized for procurement on a national scale with advantageous arrangements for local purchase and delivery?
3. Are all available quantity dis-

counts being realized, locally as well as company-wide?

4. What types of commitment are used? How much forward is the buying in relation to use requirements? What about price, and price protection?

5. Are reciprocal purchase-sales relationships used to the best advantage?

Shipment

1. Are shipments of the most economical size and frequency?
2. Are freight costs at the lowest possible point?
3. Will the commodity be prepared and shipped for most economical handling at destination?

In General

1. Could the commodity or service be produced within the company? At what cost?
2. Could the need for the commodity or service be eliminated?

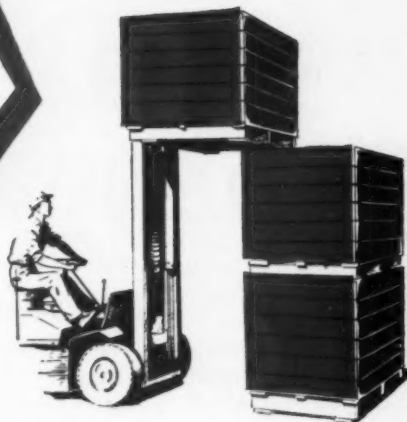
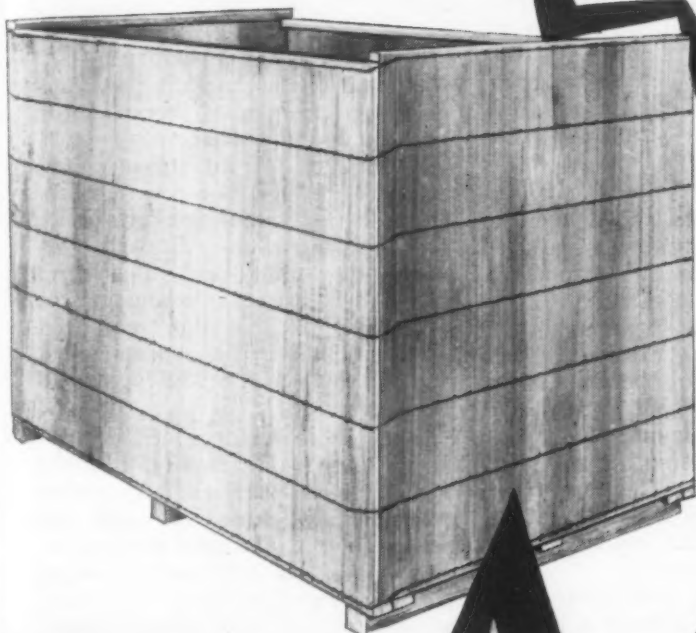
Policies

In respect to the purchase function itself, a similar analysis would pose questions such as the following:

1. Have adequate purchase policies been developed, working with purchasing personnel and other departments?
2. Have the maximum benefits been realized from this source, through policies relating to:
 - a. Utilization of the Director of Purchase?
 - b. National contracts for local purchases?
 - c. Centralized purchase of restricted commodities?
 - d. Types of commitments?
 - e. Forward buying?
 - f. Price and price protection?



OR THIS



Generalift



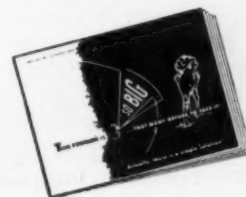
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General



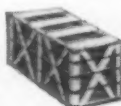
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engineered shipping containers

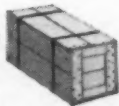
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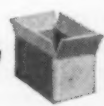
General Wirebound Crate



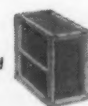
General Nailed Box



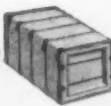
General Corrugated Box



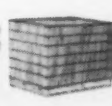
General Cleated Corrugated Container



General All-Bound Box



Generalift Pallet and Pallet Box



General Watkins-Type Box



- g. Inventories?
- h. Methods of control for the purchase and inventory of selected commodities and services?
- i. Standardization of selected commodities?
- 3. Are the policies known and observed throughout the organization?

Procedures

- 1. Have adequate purchase procedures been drawn to implement every purchase policy authorized and currently in effect? To implement the decentralized portion of the purchasing operation?
- 2. Do the purchase procedures contain only the minimum necessary directives and limitations?
- 3. Are they drawn clearly to obtain an efficient performance of the purchasing function?
- 4. Has the paperwork been simplified as much as possible, consistent with the results and records desired?

Coordination

The second part of the purchasing executive's job is the coordination of the individual purchasing agents' activities for the general welfare of the company. In the simplest case this would concern the various commodity buying groups in a central purchasing department. It is somewhat more complex under a basic plan of decentralized purchasing with centralized control and coordination.

The product division purchasing agent works directly with the General Manager, the Operations Manager, and the Plant Superintendents. He operates his own purchasing department to the best of his ability; its success or failure is his own direct responsibility.

Company-wide control of purchasing is accomplished through purchase policy determinations. In line with these, the Director of Purchase acts to coordinate the purchasing function and to attain the most efficient operation through:

- 1. Purchase policies.
- 2. Purchase procedures and recommended methods of operation.
- 3. Cooperative study and analysis of purchase requirements and procurement problems of common interest.
- 4. Development of advantageous contracts and other working arrangements for *company-wide procurement* of important commodities and services by *local purchase*.
- 5. Development, introduction, and

use of standard specifications as purchase standards for many important commodities.

6. General dissemination of important information developed at any point, e.g., particular purchase problems, beneficial vendor relationships and sources of supply, business conditions, prices and price trends.

7. Accumulation of basic purchasing information, statistical and otherwise, from each purchasing agent for the preparation of regular reports to management, which receive wide distribution.

Decentralized Buying

There are several advantages in this plan of decentralized purchasing with centralized coordination. Important among these are:

- 1. The first and most important advantage to be realized *only* through this type of operation is the development of able purchasing men, capable of carrying the responsibility and exercising the authority extended to them. These purchasing agents develop a wealth of experience, individual initiative, and ability to make decisions.
- 2. Further, the plan gives each purchasing agent at least a part of the experience of each of the others, which assists them all to operate more efficiently.
- 3. Many of the advantages of centralized purchasing are retained through contracts for company-wide procurement. At the same time, operating procedures and paperwork are simplified, emergency requirements are handled more easily, and more buying is done locally—from local sources.
- 4. From over-all management's viewpoint, each product division operates as a unit.

Problems of Common Importance

The first job, of course, is to lower the cost and improve the performance of those commodities and services used by more than one product division. This involves a wide variety of items, including raw materials; machinery and equipment; supply materials; maintenance, repair, and operating supplies; construction and services; and others.

In almost every industry, a tremendous amount and a wide variety of machinery and equipment are used. These comprise three groups, namely material handling equipment (including containers and means of transportation), process

machinery, and power transmission equipment.

Most of these are capital items. Purchase of the original equipment, in every case, is subject to all of the considerations of source, quality, and price, coupled with engineering specifications designed to meet particular requirements. Here is a specialized type of purchase of company-wide importance.

Parts and Supplies

For all of this operating machinery and equipment there is the problem of procurement of parts and supplies for maintenance and repair. Here also is a recurring requirement of major importance. A certain proportion of parts, no doubt, are most easily purchased from the original manufacturer. However, much of this total need may be obtained from sources which should be selected, to the company's best advantage.

The list of items to which this applies is a long one. Briefly, it would include items such as: automotive truck parts; belting for conveyors and elevators; fabricated steel plates and shapes; machine work; moving parts of general manufacture (e.g., conveyor idlers and pulleys, transmission equipment and parts of all kinds); tires and tubes; wire rope. Here is a list of varied but related commodities, parts, and supplies, of general company-wide importance.

General maintenance and operating supplies, aside from machine parts, include: building materials (including paint, pipe, and refractories); castings and machine work; electrical materials; laboratory apparatus and supplies; office supplies; protective and safety equipment; warehouse steel; miscellaneous supplies such as abrasives, anti-freeze, clothing, hardware and mill supplies, oxygen and acetylene.

Purchase Check List

What has the Director of Purchase to do with all this? First, in the aggregate, these materials and commodities are subject to the same type of scrutiny and review to consider and to improve, wherever possible, the efficiency of the over-all purchasing operation.

Secondly, the more important items should be individually selected for special attention, particularly with regard to specifications and the development of purchase standards, reduction of costs through national contracts for advantageous local purchase, recording and maintenance of inventories.

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Full, unrestricted flow with a minimum of turbulence is obtainable in most gate valves. You receive this and more with Ohio Brass gates, for the Flexitite Disc,[®] a unique feature of the O-B line, is an important *extra* feature providing leak-proof shutoff on all types of industrial services.

A sawed slot between the faces of the Flexitite Disc permits a slight flexing of the outer disc edges. As the valve is closed, a squeeze play action develops which forces the disc faces to adjust to the minor irregularities of the seat. This slight disc conformation (exaggerated below) produces a 100 per cent seal all around the seating surfaces. When closed, Ohio Brass gate valves are absolutely leak-tight, even on gasoline and light oil service.

If you are concerned with the movement of similar hard-to-hold liquids, be sure to ask your local Ohio Brass distributor to show you O-B industrial gate valves featuring the Flexitite Disc.

OHIO BRASS CO. MANSFIELD, OHIO

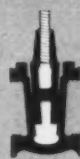


O-B NO. 22 LINE GATE VALVE
Available in rising and non-rising stem types up to three inches.

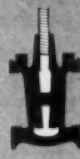
HOW SQUEEZE PLAY DISC ACTION WORKS



As valve is closed, disc is forced into seat slot



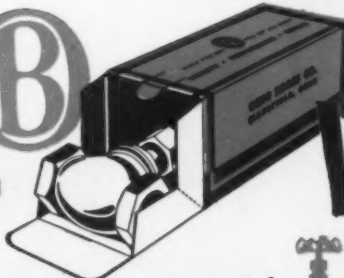
Flexitite disc adjusts. Minor irregularities nullified



Disc makes all-around contact with seat—leak-proof closure results

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CHECKS

It will be advantageous to draw up a check list for each of the major classifications of purchases. While in general these lists will follow the topical outlines already suggested, there are particular factors applicable to each, which should not be overlooked. For example, the company should receive substantial benefits and savings through the coordinated purchase of operating equipment. In addition to the basic considerations already noted, we find these factors:

1. Use of identical machinery and parts on different applications.
2. Production and sale of many items is handled by a relatively few industries and distributors.

3. The development of technical standards for purchase is a definite possibility.

4. In some instances of capital equipment, and in many of the requirements for parts and supplies, there may be negotiated national contracts for local purchases.

5. The parts and supplies especially create identical problems in forward buying and in the recording, maintenance, and control of inventory.

Fuels and purchased power constitute another group of items required in common by all divisions, and offering a fruitful field for coordination, including special considerations such as the use of the lowest cost fuel which the process will permit, use of the most favorable rate for purchased power for each operating condition, the feasibility of generating the company's own power, etc.

Construction and Services

Another problem of procurement of general interest is the purchase, by contract, of construction and services. This is a common type of action characterized by diversified requirements and, as a rule, local sources of supply. Some of the questions to be answered in attempting to improve the purchasing operation are:

1. Is a specific performance required, with guarantee?
2. Is maximum use made of standard materials?
3. Has sound competition been developed?
4. What is the experience and financial responsibility of contractors selected?
5. What proportion of materials are being furnished by the company for contractors' use?
6. Are we generally receiving contractors' prices?

7. Could the Director of Purchase help in locating and selecting contractors, and in the investigation of their responsibility and specialties?

8. Have all questions been considered concerning the union affiliations of contractors' labor?

9. Could some of the individual jobs be performed to advantage within the company?

10. Have adequate procedures been followed in negotiating the contract?

11. Are contracts approved by the legal department?

12. Is there adequate evidence of insurance?

Other Procurement Problems

There are other procurement problems of general company-wide importance, mostly of a policy and procedural nature, that should engage the attention of the purchasing executive. Among these are:

1. *Blanket Orders*—administration and control of purchases for items and services obtained under open end or "blanket" orders.

2. *Surplus*—policy and procedure for the declaration, recording, and transfer or disposal of surplus assets.

3. *Information and Reports*—accumulation of vital purchasing information from which may be assembled regular and consistent reports to management.

4. *Inventory Control*—the recording and control of inventories of replacement parts and operating supplies.

Standardization

Considerable reference has been made in this review to the matter of standards and standardization. The purchasing executive has a keen interest in this subject. He can play an effective part in a company-wide standardization program by:

1. Inquiring into, and determining the necessities and advantages, if any, in a program of standardization and the development of standards for purchase.

2. Establishing an organization and means for promoting standardization and purchase standards wherever such are found to be advantageous.

3. Developing, by cooperative action with all interested executives, engineers, and purchasing agents, desirable purchase standards, including managerial standards of policies and procedures, and technical standards for raw materials, supplies, and equipment.

The several purchasing agents could logically act together, as a committee, to coordinate the knowledge and efforts of all personnel taking part in the development of standards, formulate the standards in a consistent manner, obtain acceptance of the standards so formulated by all persons concerned, and introduce purchase standards so approved to company use.

The advantages of a program of standardization and well drawn purchase standards are very pertinent to the effectiveness of the purchasing operation. Among the benefits to be derived are:

1. Standards provide the key to the best possible coordination and "meeting of the minds" between buyer and seller.

2. Standards provide opportunities for the development of broad sources of supply, since offerings may be more easily and quickly judged on the basis of clearly defined requirements.

3. Standards develop orderliness and promote simplification, tending to reduce the number of different kinds and classes of things to be purchased.

4. Standards tend to make possible the purchase of greater quantities of similar items under national contracts for local purchase.

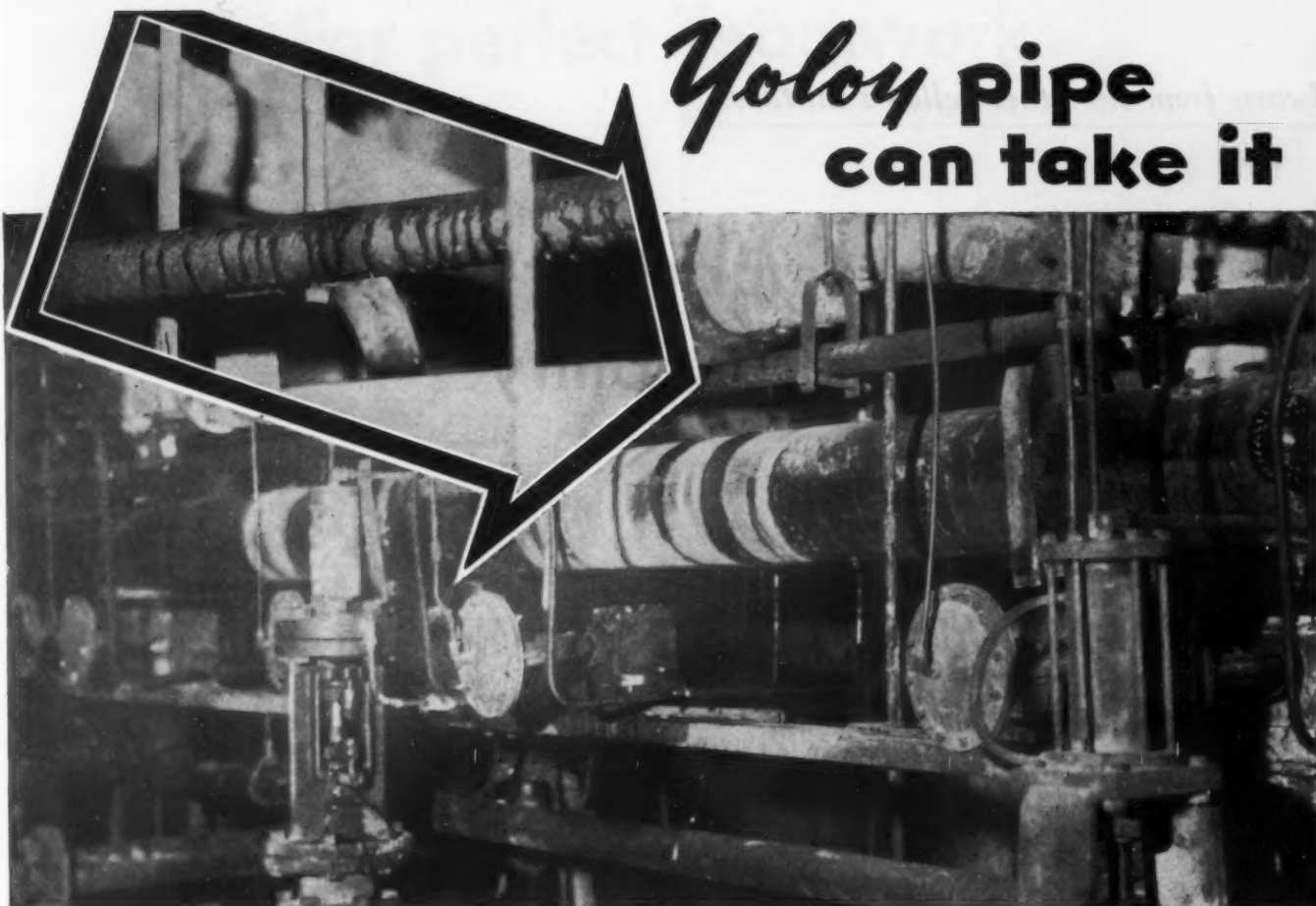
5. Standards aid in the recording and control of inventories.

6. Standards bring to attention the possible need for improvement or change by a policy of periodical review.

It is logical, therefore, for purchasing men to take the initiative in such a program. Since the standards are to be used as a purchasing tool, there is an advantage in making it a departmental project, for coordination and exchange of information between all of the purchasing men in the company and to make maximum possible use of their combined knowledge and experience, along with that of other interested personnel. Standards for common and major requirements will then be prepared with care, not hurriedly, and taking into consideration in every case all possible needs for:

- Specifications for quality.
- Performance requirements.
- Guarantees, warranties, and questions of responsibility.
- Preparation for shipment, packaging methods, and protection in transit.
- Measurement of quantity.
- Methods of sampling and testing.
- A definite basis for acceptance or rejection.

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In the arrow inset above, you see a piece of 1½" Yoloy Continuous Weld Pipe. Subject to continual corrosion, it is still in use after nearly 4 years. Regular pipe used here previously had failed and been replaced at least once a year.

This Yoloy pipe is in a booster pressure line carrying 500 P.S.I. raw cold water in an Akron rubber plant. It is in a humid basement, directly under the vulcanizers and subject to constant steam leakage and dripping, as is evident in the photograph. That Yoloy is outlasting regular pipe in this severe service is due to its unique nickel-cop-

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Some Important Aspects of Contract Liability

By Leo T. Parker

RECENTLY I received a letter from a purchasing agent who asked this question: "Can a seller positively avoid all responsibility and liability for an 'apparent' breach of a sale contract? What I mean is, for example, if a seller includes in a contract of sale a clause that he will be under no circumstances liable for defects, impurity, unsalability and worthlessness of merchandise is the seller thus relieved under all circumstances and conditions? Also, what faults should purchasers overcome to avoid loss of suits involving contracts of sale?"

The answer to the first question is "No." On the other hand, circumstances may exist under which a clause in a sale contract is valid which limits or repudiates a seller's liability and responsibility.

For illustration, in *Garofalo Company v. St. Marys Packing Company*, 90 N. E. (2d) 292, the testimony showed facts, as follows: The St. Marys Packing Company sold to the Garofalo Company 900 cases of tomato juice. The memorandum of sale shows a sale of 900 to 1,000 cases of "Rusty" cans of tomato juice at \$2 a case delivered. "As is, no recourse". In other words, the seller intended to be relieved from all future liability for defects and worthlessness of the merchandise. However, in subsequent litigation the purchaser testified that he believed the terms "Rusty" and "as is" referred *only to the outside condition of the cans*, which apparently were rusty, but believed that the contents would be

fit for the purpose of resale to others and for ultimate human consumption.

The customers who purchased the canned tomato juice from the Garofalo Company returned the same as being unfit for human consumption because the rusty condition did penetrate the cans and did cause spoilage of the contents. Soon afterward the Health Department of the city condemned the

stated that the rusty condition of the cans did affect the contents, the higher court held the seller *not* liable to the purchaser and said:

Contract Terms Are Plain

"The words 'as is, no recourse' when considered together clearly state the intent of the parties. . . In plain language, the parties contracted that the cans of tomato juice were to be delivered 'as is' and



THE WORDS IN A CONTRACT MEAN EXACTLY
WHAT THEY SAY

canned juice as being detrimental to health and unfit for human consumption. Garofalo Company, the purchaser, sued the St. Marys Packing Company to recover \$2,240.45 the purchase price paid for the canned juice.

Although testimony was given that the seller's agent verbally

that plaintiff (Garofalo Company) would have no recourse. Words are to be understood in their ordinary significance. 'No recourse' means no access to, no return, no coming back upon, no assumption of any liability whatsoever, no looking to the party using the term for any reimbursement in case of loss, or

For perfect Teamwork



Follow-thru

with ORANGE LINE LOOM LEATHERS

Here are three members of the big team *in action!* ... for this photograph was taken at 1/20,000th of a second while the loom was doing 175 picks per minute!

It's one picture in a series of amazing "stop action" photographs showing how G&K Textile Leathers *follow-thru* to prevent shuttle bounce, cut shuttle cost, stop kinky filling ... Here's proof that you can *follow-thru with leather* for better output, less downtime, bigger profits. Start with the *Big Three* in the famous G&K Orange Line:

First, the famous PICKMASTER picker, precision-built of special Hairitan® Leather — the only material that can withstand the repeated blows of the shuttle spur without causing shuttle bounce or getting over-heated. Shuttle bounce causes kinky filling, and over-heated spurs cause trouble.

Second, the famous BOXMASTER Hairitan Leathers. Again a special Hairitan Leather that maintains the original dense, high-friction surface as it wears. No coarse fibres to catch filament rayon — no rough surface spots to interfere with the smooth boxing of the shuttle. You



CUT SHUTTLE COST

KINKY FILLING

INCREASE PROFITS

can adjust your boxes and forget them when you cover with BOXMASTER Leathers.

Third, the famous Hairitan Check Strap, hair-on or hair-off, straight or endless types. These are built to *flex* and *flow* twice a second, month after month to cushion the picker stick without wearing on the edges. Only leather can stand up in this tough service — and G&K Check Straps of Hairitan Leather are proving that a good check strap is a Loom Fixer's delight!

Follow-thru with leather for better, more profitable loom hours. And look to Graton & Knight and its southern affiliate, Dixie Leather Corporation, for the best in TEXTILE LEATHERS.



Textile Leathers

FAMOUS ORANGE® LINE TEXTILE LEATHER

GRATON & KNIGHT COMPANY, WORCESTER, MASS.

DIXIE LEATHER CORPORATION, ALBANY, GEORGIA *Affiliate*

MARCH, 1951

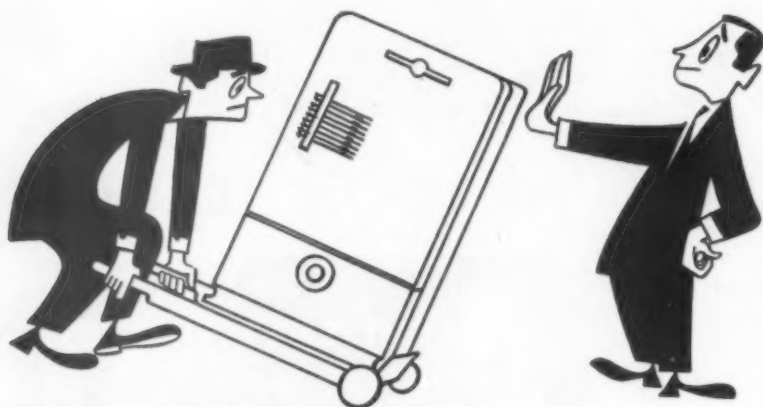
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damage, or failure of consideration in that which was the cause, the motive, the object, of the undertaking or contract. . . Plaintiff purchased the cans of tomato juice in the condition that they were in when sold. In our opinion the words 'as is' included the contents as well as the cans. Plaintiff also purchased the merchandise with the understanding that it would have no recourse against defendant. At the time of purchase plaintiff understood that it was taking the merchandise 'as is' and that it could not

Written Contract Governs

Another important point of law established by all the above higher court decisions is that a dissatisfied purchaser cannot obtain a favorable verdict on the plea of the seller's fraud where the contract contains an "as is" clause, and the purchaser bases his plea of fraud on verbal statements made by the seller *in addition* to the written contract. This is so because verbal promises, statements and guarantee which contradict clear terms of a written con-



DISSATISFACTION WITH A PURCHASE IS NOT SUFFICIENT GROUNDS FOR ITS RETURN

look to the defendant (seller) for reimbursement in case of loss or damage because of the condition of the merchandise."

Also, this court refused to listen to testimony of the purchaser regarding verbal statements allegedly made by the seller's agent. In this respect the court said:

"Plaintiff (purchaser) would not be permitted to introduce testimony that the words 'as is' referred only to the outside condition of the cans, and of an express warranty that the contents of the cans would be fit for human consumption. Manifestly, the attempt to prove these averments would violate the parole evidence rule. . . Such proof is inadmissible to vary the terms of an express contract. We have held that the attempt to prove plaintiff's averments would be an attempt to vary the terms of the written contract."

For comparison, see Roby Company v. Cade, 158 So. 840. Here the court said that the expression in a sales agreement that merchandise is sold "as is" implies that the buyer is taking delivery of goods in some way defective and upon express condition that he will not at a later date complain.

tract never can be introduced as testimony before the court. Otherwise for what use or purpose would a seller require a written contract?

For illustration, in Lande v. Southern, 193 Pac. (2d) 144, the higher court clearly held that contracting parties may agree that *all terms* of the contract are embodied in the *written contract* and that parole evidence is inadmissible to add to, alter, or vary terms of the contract. Hence, a contract clause is *valid* which states: "This written contract contains all obligations, promises, guarantees and statements of the contracting parties. All verbal agreements, promises, etc. are hereby cancelled."

Also, see Long Beach Drug Company v. United Drug Company, 88 P. (2d) 698. This court said:

"When the parties have agreed that the terms of the contract are embodied in a written document executed by them, evidence is inadmissible to add to, alter, or vary the terms of the contract as set forth in the writing."

Dissatisfied Purchaser Loses Suit

According to a recent higher court, a dissatisfied purchaser of merchandise who sues the seller for

damages and rescission of the contract must *prove* by disinterested witnesses that the subject of the sale was defective and not equal to the seller's guarantee. Otherwise the court will render a decision in favor of the seller.

For example, in Baker v. Smith Bros. Equipment Company, 46 So. (2d) 640, the testimony showed facts, as follows: One Baker purchased refrigerating equipment for a business building.

After using the equipment several months, Baker sued the seller and asked the court to award him damages and also asked the court to compel the seller to take back the equipment and refund the purchase price. Baker *alleged*, but did not positively prove, that the temperature would vary from forty degrees to seventy-five degrees, and as a result the coil became so heavily frosted and covered with ice that it necessitated defrosting three times per week, which required from one hour to one and one-half hours. Baker also testified that the equipment was unsatisfactory in other respects.

However, since Baker *failed to prove* any of his allegations by witnesses, the higher court held the seller not liable to Baker who must keep the equipment. The court said:

"The conclusion is easily reached that plaintiff (Baker) became dissatisfied and decided to recover the amount he had invested."

Purchaser At Fault

Modern higher courts consistently hold that if for any of many reasons a purchaser is at fault the seller is automatically relieved from liability for breach of a sale contract.

For example, if a seller ships a part of an order for merchandise and through an error the merchandise does not conform with the purchaser's specifications and yet the purchaser accepts and pays for this first shipment, the seller can compel the purchaser to accept and pay for the complete order.

For example, in Rode & Brand v. Kamm Games, Inc., 181 Fed. (2d) 584, the testimony showed facts, as follows: A purchaser gave a manufacturer a written order for 110,000 Kamm Baseball Games "to be mounted to 30 point chip." This order was promptly acknowledged by the manufacturer in a written "Acknowledgment of Order" which described the orders as calling for the lithographed sheets "to be mounted to absolute register on 30



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point smooth water finished Chip Board." Promptly upon making the contract, the manufacturer immediately ordered from its suppliers 20 point chipboard and began mounting thereto 60 pound lithographed paper sheets. During the month of November it delivered, and the purchaser accepted 46,100 games. These games had an average thickness of 28½ points, which is within the trade tolerance of 10% if the contract called for a total thickness of 30 points. The purchaser paid for the games thus far delivered, but failed to accept the balance of the order.

The manufacturer sued the purchaser for \$19,621, the profits he would have earned had the purchaser accepted and paid for the balance of the games.

The purchaser contended that he could not be held liable because the manufacturer had breached the contract which called for games "with an over-all thickness of 37 or 38 points. The purchaser argued that the games delivered did not comply with these specifications.

Nevertheless, the higher court held the purchaser liable to the manufacturer for \$19,621 damages, saying:

"There is an additional fact, more weighty than those recited. This is that defendants (purchaser) received, paid for, and distributed to the retail trade thousands of these games without ever once complaining that they did not comply with the terms of the contract."

Must Notify Seller Promptly

The higher courts hold that if a purchaser delays sending a seller a notification that purchased merchandise does not comply with guarantee given by the seller, the purchaser is at fault and *automatically* forfeits his legal right to recover damages for the seller's breach.

For example, in *Mon Equipment Company v. Quincy Supply Company*, 93 N. E. (2d) 231, it was shown that a manufacturer guaranteed the quality of shock absorbers to retail dealers who sold some of the merchandise and had no immediate complaints regarding them. Later other customers complained of defects in the shock absorbers and returned the merchandise. A letter was sent by the retail dealer to the manufacturer explaining that the merchandise was defective and "we hesitate to sell" same to customers.

This letter was the first and only notification which the purchaser sent

to the manufacturer that the merchandise was unsatisfactory and not equal to the guarantee. This letter was mailed to the manufacturer four months after the merchandise was received by the purchaser.

In holding the manufacturer not liable on the guarantee, the higher court said:

"Certainly a lapse of more than four months before giving notice would be unreasonable. We are of opinion that the notice was defective in that it was not shown to have been seasonably given and in this respect."

Unreasonable Time

All higher courts hold that if no time is specified as to when a contract shall be terminated, it must be terminated within a "reasonable time". Therefore, a purchaser who fails to complete his obligations under a contract within a "reasonable" time is guilty of breach of the contract. This means that he cannot expect or require the other party to fulfill his contract obligations.

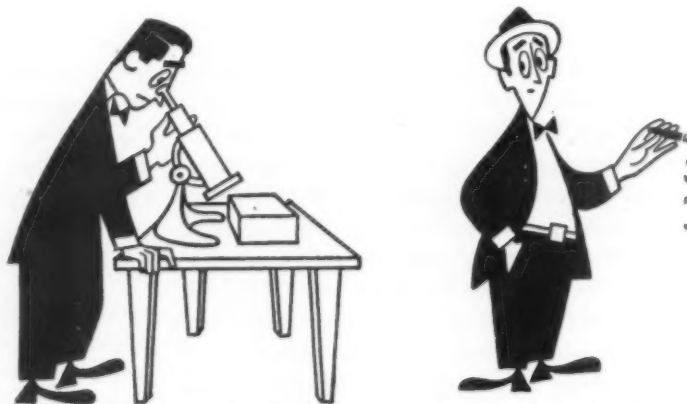
For example, in *Detmer v. Miller*, 220 S. W. (2d) 739, it was shown that a man named Miller had an agency for the sale of Ford automobiles. One Detmer owned a lime

mer. Then Detmer closed his plant, and would deliver no more lime to Miller. Four months later Detmer drove to the business district and parked the automobile on the street. When he returned the automobile was gone. Miller had taken possession of the automobile because he had not received full payment for it.

Detmer sued Miller for \$550 actual damages and \$420 punitive damages. The higher court held Miller liable, and said:

"While it is a conceded fact that defendant (Miller) had never received 255 tons of the lime to which he had been entitled, the whole question of whether plaintiff (Detmer) was in default depended upon whether he or defendant was responsible for the nondelivery of the balance of the lime . . . It is fundamental in the law of contracts that when a contract is silent as to the time for its performance, the law will imply that it shall be performed within a reasonable time."

The court said further that since Miller had delayed 13 months in calling for and taking delivery of the full quantity of lime he had delayed an *unreasonable* period of time, thus forfeiting all his legal rights to payment.



**THE TIME TO COMPLAIN ABOUT QUALITY IS ON
THE VERY FIRST SHIPMENT**

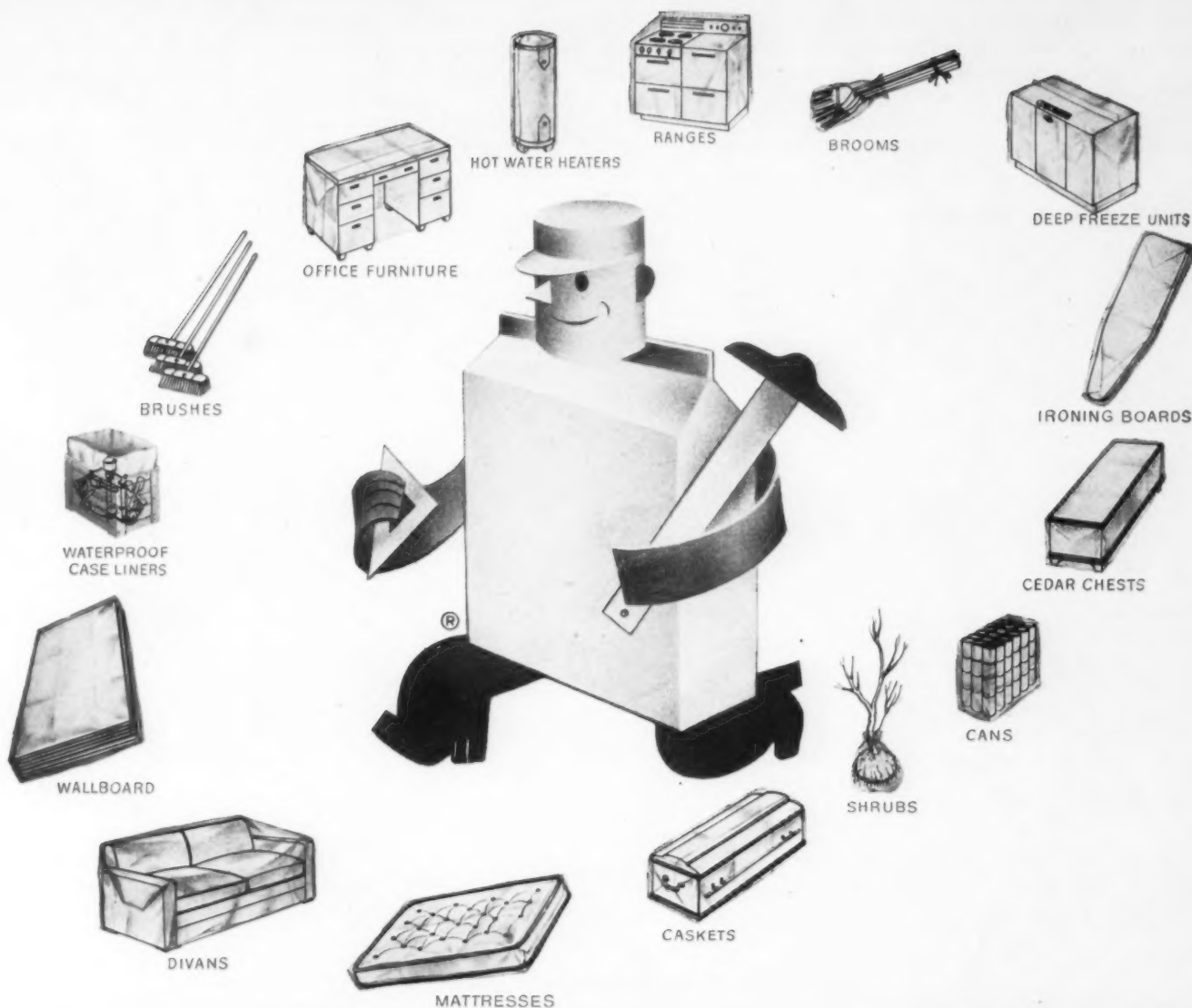
crusher. Detmer and Miller entered into a contract whereby Miller, the automobile dealer, would sell Detmer a used Ford automobile in exchange for 755 tons of lime. According to the contract, Miller was to call for the lime at the crusher and haul it away in his trucks. Nothing was said as to when Miller would call for the lime. Detmer took delivery of the automobile at once.

During the following 13 months Miller hauled away only about one-half enough lime to receive payment for the automobile delivered to Det-

mer. Another important point of law was decided by this court. This law is: One who breaches a contract and also performs an act damaging the other contracting party is liable for additional or punitive damages.

In this case Miller was held liable to Detmer not only for \$550, the value of the automobile which he repossessed, but also for additional \$420 punitive damages. The court said:

"While proof of malice is required as a basis for the allowance of punitive damages, it is in no sense nec-



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essary that there be proof that the defendant was actuated by personal ill will, spite, or hostility. On the contrary, it is enough if there is evidence of legal malice, which is the intentional doing of a wrongful act without just cause or excuse."

Check Is An Exception

Although, as above explained, unreasonable delay of a buyer may automatically forfeit his legal rights, this rule of law is not applicable to bank checks.

For example, in *Scott-Smith Company, Inc. v. Rajeski*, 70 Atl. (2d) 454, the testimony showed that at the time of a sale the purchaser paid \$900.00 and gave the seller a check for balance due. For some reason the seller filed away the check and never presented it for payment. Several months later the seller sued the purchaser for the balance due on the account. The purchaser defended the suit claiming that delay of several months in presenting the check for payment forfeited the right of the seller to collect payment.

The higher court refused to agree with this argument and ordered the purchaser to pay the full balance due on the purchase price.

This court held that so long as an account is not paid the debtor is fully liable for payment, irrespective of the reason payment was not made.

Seller Keeps Legal Title

Frequently the argument has been erroneously presented that if a seller retains legal title in merchandise or equipment he cannot be held liable to the purchaser for breach of the conditional sale contract. However, this is *not* the law.

For example, in *Pioneer Company, Inc. v. McConnell*, 212 Pac. (2d) 641, it was shown that a manufacturer sold to one McConnell a machine under a conditional sales contract, the manufacturer retaining title to the machine with the right to terminate the contract and repossess the machine upon the failure of McConnell to make agreed payments of the installments of the purchase price. After the first payment McConnell refused to make any further payments on the contention that the machine did not do the work that the manufacturer warranted it would do.

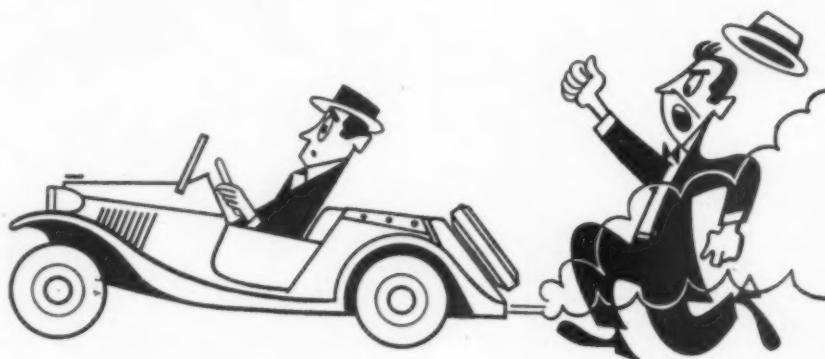
In subsequent litigation the manufacturer argued that McConnell could not sue for damages because under the terms of the conditional sale contract the title to the machin-

ery remained in the manufacturer until fully paid for by the purchaser. The higher court refused to agree with this contention saying:

"In the instant case, assuming that there was a breach of warranty, the injury immediately arose and the damage was done . . . For this damage the defendant (McConnell) was entitled to recover damages . . . He (McConnell) had a right to introduce evidence to prove that there had been a breach of that warranty and to show the extent to which he had been damaged."

the anti-freeze.

Shortly thereafter, and before any sale had been made, the purchaser became suspicious of the quality and fitness of the anti-freeze and of the manufacturer's representations, and took one of the sealed gallon containers to a chemist who made a chemical analysis which showed that the product was not of the same base, but contained five pounds of calcium chloride per gallon, which when coming in contact with iron and other metals caused them to disintegrate, cor-



DIRECT ACTION TO COLLECT DAMAGES MAY BE EXPENSIVE IF THE LAW DISAGREES

Purchase Price Plus Damages

Considerable discussion has arisen from time to time over the legal question: If a seller breaches a verbal guarantee, can the purchaser sue the seller and recover the full purchase price, plus any and all damages he may have sustained as a result of the breach? According to a recent higher court the answer is "yes, if the purchaser proves that he was damaged." Otherwise he may recover the purchase price.

For example, in *Nichols v. Lea*, 225 S. W. (2d) 684, it was shown that a manufacturer sold through a salesman \$975.00 worth of anti-freeze to a purchaser in sealed one gallon containers. The evidence showed that at the time of the sale the manufacturer's salesman verbally represented to the purchaser that the anti-freeze was as good as another, well-known, standard anti-freeze, that it had the same base (Ethylene Glycol), would mix with other anti-freeze then on the market, and was suitable and fit for the use intended. The purchaser testified that he relied on these verbal representations and purchased

rode and slough off.

Following this information, the purchaser filed suit to recover from the manufacturer the purchase price, \$975.00.

The counsel for the manufacturer contended that he had breached no written guarantee and that the alleged verbal statements of the salesman were not a valid warranty or guarantee.

Nevertheless the higher court ordered the manufacturer to take back the anti-freeze and pay the purchaser \$975.00, the original purchase price. The higher court said:

"To constitute an express warranty, it is not necessary that the word 'warrant' be used, but may be based on the statements of the seller as to the quantity or condition of the merchandise he is selling."

For comparison, see *Robbins v. Trotter*, 217 Pac. (2d) 1027. Here a higher court awarded a purchaser heavy damages, in addition to the original purchase price, where the testimony showed that the seller failed to deliver merchandise on the promised date, and as a result of the breach the purchaser suffered finan-

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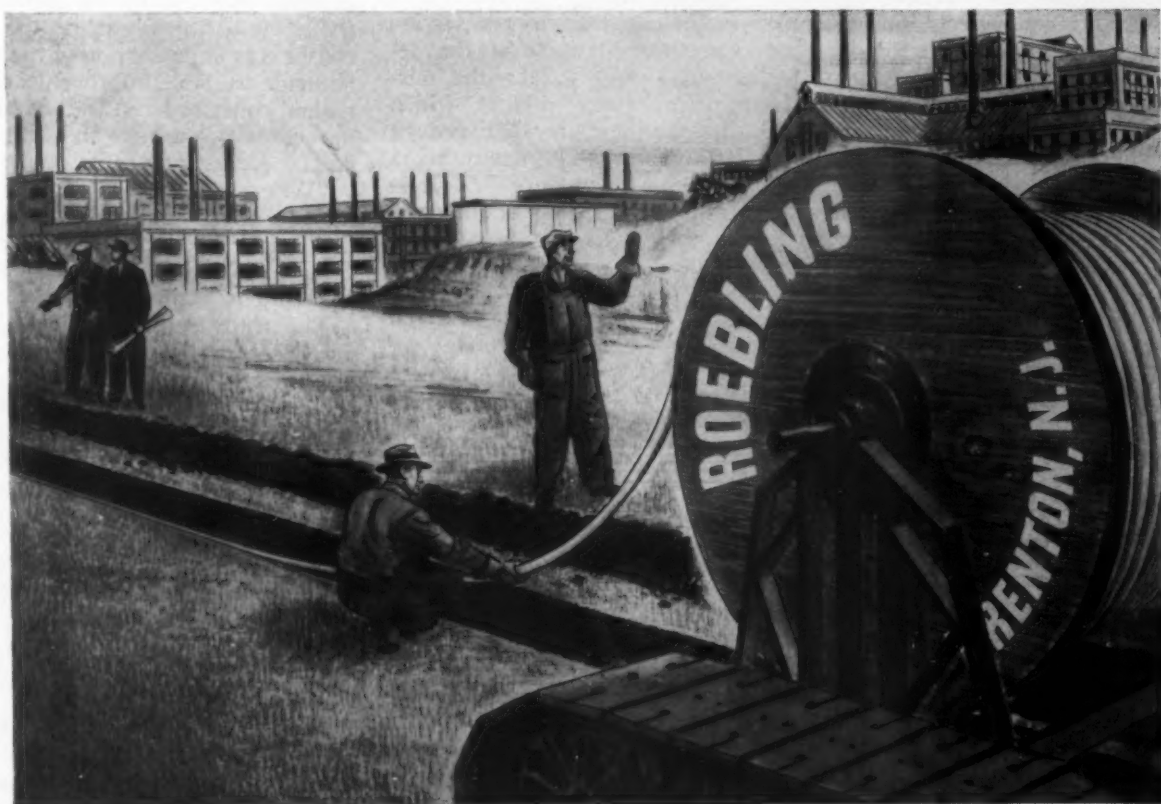
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cial loss. The higher court said:

"One damaged by the failure of the seller to deliver an article purchased within the time specified in the contract of sale, may recover damages therefor. The measure of damages is the loss directly and naturally resulting in the ordinary course of events from the seller's breach of contract."

Must Sue For Profits

An important point of law in favor of purchasers is that a seller may be at fault technically, and thereby forfeit his legal right to recover from a purchaser who breached a sale contract. This situation exists where a seller sues a purchaser for the contract price of merchandise instead of suing for anticipated profits.

According to a recent higher court this is the law: Where the buyer wrongfully neglects or refuses to accept purchased goods, the seller may maintain suit against him for damages or profits for non-acceptance, but not for the contract price. Where there is an available market for the goods, the measure of damages is the difference between

1057, the testimony showed facts, as follows: A purchaser ordered 1,000 electric motors from a manufacturer at an agreed price of \$2.45 per motor. The manufacturer pursuant to the order manufactured the motors especially for the dealer. The purchaser failed and refused to pay for motors, or to accept delivery. Then the manufacturer sued the purchaser to recover \$2,450.00, the contract price of the motors.

In refusing to hold in favor of the manufacturer the higher court said that the manufacturer should have first notified the purchaser that he was holding the motors for his disposition and then, instead of suing the purchaser for the contract price, he should have sued for the profits he would have earned had the purchaser fulfilled the exact terms of the contract. The court said:

"It is clear from the complaint in the present case that the transaction was the alleged failure of the defendants (dealer) to pay the purchase price of the motors which plaintiff (manufacturer) alleged he had manufactured pursuant to a contract with defendants . . . It is clear from the wording of the com-

plaintiff takes back the subject of the sale, he *cannot* recover damages, but the defaulting purchaser must account to the seller for all earned profits, and the purchaser cannot receive back from the seller money expended to improve the subject of the sale.

For example, in *Allen v. Borlin*, 84 N. E. (2d) 575, it was shown that a purchaser made a contract to purchase a plant for \$18,500, and made a down payment of \$625. The purchaser took possession on April 1, and four months later voluntarily returned possession of the plant to the seller after having earned profits of \$2,062. The seller sued the purchaser.

During the trial the purchaser testified that he was compelled to give up the contract because of physical incapacity resulting from injuries received in an accident at the plant. Although while the purchaser was in possession of the plant he made valuable improvements, the higher court ordered the defaulting purchaser to return the full \$2,062.00 earned as profits, and said:

"Where the purchaser is in default, without fault on the part of the vendor (seller), the making of valuable improvements will not entitle him to compensation."

The court refused to award the purchaser any compensation for improvements but refused to hold the defaulting purchaser liable in damages to the seller, holding that when a seller voluntarily takes back the subject of sale from a defaulting purchaser, the latter is not liable in damages to the seller for the breach.

On the other hand, if a seller breaches a contract the purchaser always may sue and recover at least the purchase price, if he offers to deliver back to the seller the subject of the sale.

For example, in *Simmons Company v. Brooks*, 66 Atl. (2d) 517, it was shown that a man named Brooks purchased from a seller a machine which was warranted "to be in good operating condition."

Brooks sued the seller and asked the court to compel him to take the machine back and refund the purchase price. Brooks proved that the machine was in very poor condition, and inefficient. In holding in favor of Brooks, the court said:

"Without further detailing the testimony, we conclude that there was ample evidence supporting the conclusion of the trial court that plaintiff (Brooks) was entitled to rescind the contract and recover the amounts paid."



THE SUCCESS OF A COURT ACTION DEPENDS ON
BRINGING THE PROPER COMPLAINT

the contract price and the market price at the time when the merchandise should have been accepted by the purchaser. However, under no circumstances may a seller sue and recover the contract price of merchandise which the purchaser refused to accept and pay for. This is so although the seller manufactured or procured the merchandise especially for the purchaser.

For illustration, in *B. J. Shelton Company v. Theo Muckle Engineering Company*, 218 Pac. (2d)

plaint that plaintiff (manufacturer) sought to recover the purchase price of one thousand motors. There is nothing whatever in the complaint to indicate that plaintiff sought to recover damages, as distinguished from the contract price."

Seller Takes Back Plant

Generally speaking, a purchaser who breaches a purchase contract is fully liable to the seller for all damages. However, according to a recent higher court if the seller vol-

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FR-300

MARCH, 1951

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New Products Ideas



If you want more information on New Products items, just list the item numbers in a letter to Purchasing Reader-Service Department on your company letterhead. This also applies to Catalogs and Bulletins described on Pages 19, 21, 22, 24 and 178. See Page 19.

Induction Motors

Fairbanks, Morse & Co., 600 S. Michigan Ave., Chicago, Ill., has extended its line of type QZE, totally enclosed, non-ventilated, squirrel cage, induction motors to include continuous duty ratings built in NEMA standard frame 284. At present, 7½ hp, 1800 rpm and 5 hp, 1200 rpm motors are in production. The motors conform in all respects to NEMA and ASA Standards for totally enclosed machines. They are identical in mounting dimensions with standard totally enclosed, fan-cooled motors of the same ratings. Bulletin 1215 available.

No. 101 — For further information see Page 19

Rubber Pail



A strong, durable, safe-to-handle rubber pail for handling corrosive chemicals is one of the latest Hanson-Van Winkle-Munning products for plating rooms. Among its features: a unique safety-grip construction at the bottom which gives a firm hold for pouring; graduated markings on the inside for accurate

measurements from 1 to 12 quarts, and from 1 to 3 gallons, a lead-coated, stainless steel, bail-type handle with hard rubber grip to insure safe handling. The handle is molded into the pail, moving freely in cast lead bearings. The rubber compound used in the pail is slightly flexible but very tough. Base of the pail is reinforced. H-VW-M is at Matawan, N. J.

No. 102 — For further information see Page 19

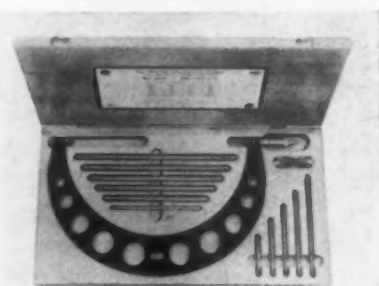
Palletless Handling



The Pul-Pac, fork-truck device that handles unit loads without the use of conventional pallets, is now being made with several improvements based on users' experience by Clark Equipment Co., Industrial Truck Divn., Battle Creek, Mich. Principal change is the adoption of a pantograph-type linkage to actuate the gripper-jaw and pusher rack. Previously, long piston rods had been employed. The new construction permits a shorter hydraulic stroke from a more powerful piston, and eliminates severe bending stresses on long pistons. The unit can operate in less space than former models. There are no restrictions on tilt of uprights. The Pul-Pac has a detachable mounting and is interchangeable with standard forks up to 54" usable length.

No. 103 — For further information see Page 19

Micrometer



No. 224 micrometer made by L. S. Starrett Company, Athol, Mass., can be used for all measurements from 6" up to 12" by means of interchangeable anvils. The six anvils provide the full range in steps of one inch. Each anvil is marked to show capacity and is fitted with an adjusting collar which compensates for wear and acts as a seat when clamped in position by a locking collar. Wrenches are furnished for adjustments. The micrometer frame is made from a steel forging and is finished in black enamel. Sleeve and thimble have rust-resistant, no-glare Satin Chrome finish which makes markings stand out clear.

No. 104 — For further information see Page 19

Demand-Type Oxygen Unit

A ready supply of oxygen may save lives in many types of industrial emergencies. Mine Safety Appliance Co., Pittsburgh 8, Pa., has brought out a unit it says meets the basic requirements where oxygen inhalation is needed—it is simple to operate, readily portable, and efficient in its use of oxygen. Self-contained in a sturdy carrying case, it is put in operation merely by open-

(Please turn to page 132)

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of machined parts
low or slow?
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LIKE THESE



If you use machined parts in your products and the present supply situation is giving you a headache . . . *it's time you switched to Gramix*, the powdered metal parts that can be produced in quantity for reasonably prompt delivery. Gramix iron parts of intricate shape can be die-pressed to tolerances within .0005", and cut costly machining time. Gramix parts are oil-impregnated for self-lubrication thus eliminating the added ex-

pense of extra oil supply and servicing. Gramix parts are tough, strong, and dependable under all operating conditions. Gramix can help you *improve the mechanical performance of your products*, cut manufacturing costs, and eliminate production snarls due to uncertain parts supply. Go to Gramix . . . the leader in the powdered metal field. Write to us here in Saginaw today for the full facts.

82

THE UNITED STATES GRAPHITE COMPANY

DIVISION OF THE WICKES CORPORATION • SAGINAW, MICHIGAN

MARCH, 1951

Want Additional Product Information? See Page 19.

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(Continued from page 130)
ing the cylinder valve and placing the facepiece on the patient. Oxygen is administered automatically as the patient's breathing requires it. The instrument also can be used to supply oxygen in conjunction with artificial respiration in cases of asphyxia. Complete details available in Bulletin CW-5.

No. 105 — For further information see Page 19

Fork Lift Truck



The telescoping uprights on this "Tiermaster" fork lift truck are low enough (72") to enter a motor truck van body. Yet they have a lift that will tier merchandise and materials three pallets high (117" from floor to forks), according to the maker, Mobilift Corp., 1135 S.W. Yamhill St., Portland 5, Ore. Overall height of the mast extended is 142". A roller chain lift mechanism allows unobstructed view between the uprights and lifts at a speed of more than 45 fpm. The truck is a stand-up type of 2,000 lbs. capacity. It has an outside turning radius of 57" and a zero inside turning radius. It is powered by a 3-cylinder gasoline engine.

No. 106 — For further information see Page 19

80-Hour Portable Light

A new portable light, intended primarily for civilian defense emergencies, but suitable for various industrial applications, provides 80 hours of continuous light on each battery charge. A special 2-filament bulb furnishes work or rescue light for 80 hours on one filament—much longer if used intermittently—or a higher power floodlight for 20 consecutive hours on the second filament. Thumb-operated switch controls both filaments. A substitute reflector provides a powerful mile-range searchlight. The lens is shatterproof. Beam can be tilted to any height by fingertip pressure. Made by Carpenter Mfg. Co., Boston 45, Somerville, Mass.

No. 107 — For further information see Page 19

Hammer Tacker



Fastener Corporation, Chicago 14, Ill., has made two important changes in the heavy duty Duo-Fast HT-755 hammer tacker to greatly increase its all-around efficiency. A snap-off "Jiffy Jaw" (illustrated) has been added to provide fast, easy cleaning. A constantly-engaged plunger and cam mechanism gives greater driving power as required on the heavy $\frac{3}{8}$ ", $\frac{1}{2}$ " and $9/16$ " staples used in the tacker.

No. 108 — For further information see Page 19

Localized Lighting

Two new series of localized lighting equipment for machines, benches, etc., both carrying the Underwriters' Laboratories' label, have been put on the market by The Fostoria Pressed Steel Corp., Fostoria, O. Series 412 incorporates flexible adjustable tension joints to permit positioning for individual requirements. Joints allow adjustment of tension according to need. Series 400 uses strong flexible tubing. Wiring in both series is totally enclosed. Wire breakage due to flexing joints or tubing is eliminated. Mounting bases on both series fit regulation outlet boxes or may be fastened to any flat surface. Catalog available.

No. 124 — For further information see Page 19

Goggle Padding Mask



Sewing padding masks to its safety cup goggles is no longer necessary says Willson Products, Inc., Reading, Pa. The company now has a molded rubber detachable mask which is attached to the goggles by

means of a beaded molding which slips easily over the rims of the eye-cups. It provides a firm, light-tight joint, and gives better protection in welding, chipping, heavy dust and acid operations. The mask is replaceable, and can be changed without use of any tools. The soft, molded rubber fits snugly and comfortably to all face shapes. The mask gives added clearance when goggles are worn over prescription glasses.

No. 110 — For further information see Page 19

Spraying Pump



If you're troubled with blobs in industrial spraying operations, the new Mogul Powerflo pump may be your answer. The pumps, which operate in original 400-lb. and 100-lb. drums, or in bucket-type containers, are equipped with a device called the Evenflo, which prevents spurting. The material to be sprayed is supplied through hoses for spray gun, pole gun, or extrusion gun application. No messy transfer operations are necessary. The pumps operate within a broad air pressure range (from 20 to 175 psi). Each pump weighs 35 pounds. They can be serviced easily. Made by Gray Company, Inc., Industrial Divn., Graco Square, Minneapolis, Minn.

No. 111 — For further information see Page 19

Grinding Wheel Bond

A 5% to 10% boost in grinding and finishing output is achieved through use of its new 79E grinding wheel bond, says Chicago Wheel & Mfg. Co., 1101 W. Monroe St., Chicago 7, Ill. The new bond, developed for vitrified grinding wheels operated at speeds up to 6,000 s.f.p.m., means lowered down-time for change-over or wheel dressing, and longer production time per wheel, according to the company. A 79E bonded wheel is claimed to remove more stock than an ordinary wheel, with a faster, smoother cutting action. It is impervious to water, acid, oil, and normal temperature variations.

No. 112 — For further information see Page 19

(Please turn to page 135)



Stainless Steels
of all analyses

SuVeneer Clad Metals
copper- and nickel-clad steel

Alloy and Spring Steels
and specialties

the *Specialists'*
name
in fine strip steels

Every Superior customer benefits by the fact that our entire manufacturing concern is with quality strip steels. No other product claims a share of our attention . . . all of our experience, research, equipment and methods are concentrated solely on precision strip steel production.

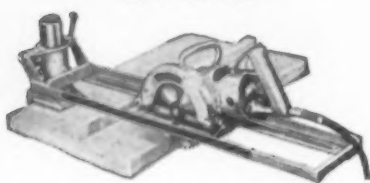
That's why Superior strip behaves properly in your fabricating process—and why you can count upon Superior for consistent quality in performance, coil after coil.

Superior Steel

CORPORATION
CARNEGIE, PENNSYLVANIA

(Continued from page 132)

Saw-Guide



Skilsaw, Inc., 5033 Elston Ave., Chicago 30, Ill., has brought out a saw-guide that converts a portable electric saw into a portable radial saw in a matter of seconds. The 26-lb. unit is easily attached to a small platform on two saw horses. With simple adjustments, cross-cuts, bevel, miters, bevel-miters, rips, and bevel rips are accurately, easily and safely made. Skilsaw says it makes gang-cutting and pre-forming simple and precise operations. Made for use with Skilsaw models 77, 825, 87 and other popular makes with a base width capacity of 4-13/16" to 5 1/8".

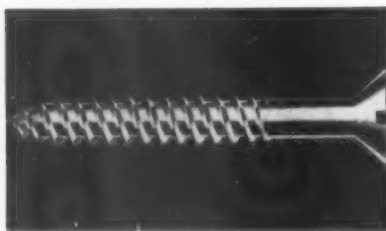
No. 113 — For further information see Page 19

Non-Skid Floor Surfer

A low-cost liquid-based carrier which blends with heavy duty floor paint to form a durable, non-skid surface is being marketed by Lowebo, Inc., 1525 E. 53rd St., Chicago 15, Ill. Known as "Adtex", the product is mixed with equal parts of any oil-based, latex or rubber paint and applied with a brush. Lowebo says the mixture dries as rapidly as the original paint, and that odor of the paint is reduced. Shade of the paint is not affected. Textured surface produced by the combination helps reduce accident hazards in all types of factories and industrial installations. Can be used on walls and exteriors, also, to produce "rough plaster" finish.

No. 114 — For further information see Page 19

Double-Threaded Screw

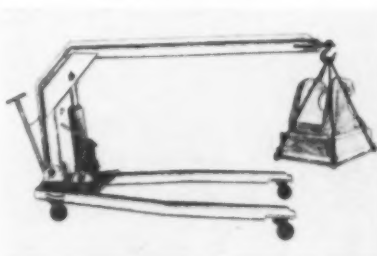


Tests in wood assembly plants show that the use of TWINfast wood screws cuts driving time in half and increases holding power, says New Process Screw Corporation, Waterville 48, Conn. The two separate threads of the screw start from opposite sides of the shank,

spiral the root in parallel formation, and terminate in a single centered point. Because twice as much thread enters the material at each turn, the number of turns needed to seat the screw is halved. Cylindrical shank provides more metal for greater strength and increases the thread area for additional contact with the material and greater holding power. The screws come with slotted or Phillips heads and are furnished in steel or brass in all standard sizes and finishes.

No. 115 — For further information see Page 19

Hydraulic Hoist



One man can move and handle vehicle power plants, heavy castings, and other equipment weighing up to 5,000 lbs. with this portable hydraulic hoist. (Another standard model has 2,500 lbs. capacity). Unique design permits it to get into places inaccessible to overhead equipment. Sensitive control of boom allows alignments to a fraction of an inch. Loads can be raised to a height of 8' 6". Boom length is 7' 6". Unit moves easily on ball bearing casters. No special skill is needed to operate. Called the Latch Hoist and Carry, it is made by South Chester Corp., 1418 S. Penn Sq., Philadelphia 2, Pa.

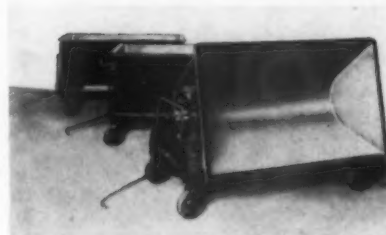
No. 116 — For further information see Page 19

Drum Lining

A permanently flexible, pure vinyl system drum lining material that provides protection for both drum and contents is the latest product of Gates Engineering Co., Box 1711, Wilmington, Del. The lining has a high impact resistance rating and produces a gleaming white, sanitary finish. It is non-toxic and odorless. Adhesive characteristics insure maximum bonding with container surface. It will not crack, chip, or peel off, Gates says, and retains its elasticity even after long aging. Can be used on drums carrying most of the weaker acids, salts, wetting agents, dyes, dispersing agents, alcohol and similar chemicals. May be sprayed with either hand-type or automatic spray guns, or with brushes.

No. 117 — For further information see Page 19

Dump Trucks



These trucks, which can be used for any dry material, dump sideways, eliminating shoveling and other time-consuming operations. They can be drawn by hand or vehicle, singly or in trains. They may be used for temporary storage. The counterbalanced hood is made of sheet metal, welded at the joints. Frame is of structural steel and wheels can be of iron or rubber. Capacity is approximately 1 cu. yd. The truck measures 36" wide, 40" high and 72" long. Other sizes can be furnished. Made by The Klaas Machine & Mfg. Co., 4322 E. 49th St., Cleveland 25, O.

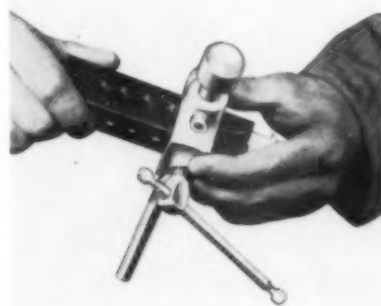
No. 118 — For further information see Page 19

Self-Adhesive Nameplate

A self-adhesive metal nameplate which requires no pre-drilling of holes, screws, rivets or other fastening devices has been announced by C & H Supply Co., Metal-Cal Divn., Boeing Field, Seattle, Wash. The nameplate consists of a .003" thickness of aluminum foil anodized and dyed to Government specifications. Backed with a high tensile bonding material, these Metal-Cals can be applied to any smooth, cohesive surface on metals, porcelain, Bakelite, polystyrene, glass, wood, paint, etc. Letters and characters are permanently clear and legible because they are made a part of the aluminum foil. Made in various colors. Sample available from manufacturer.

No. 119 — For further information see Page 19

Tube Flaring Tool

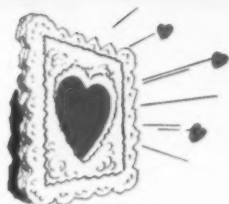


Model 410 combination tube flaring tool of The Parker Appliance Company, 17325 Euclid Ave.,

(Please turn to page 138)



PATENTED



**Roses are red
Violets are blue
Displays like this
Make sales for you!**

Here's a "Valentine" that *dealers* love—a clever display packed with tempting Valentine candies. It's a combination sure to brighten any youngster's eye. And *that's* sure to brighten the day's cash register figures! This H & D display is a favorite of manufacturers, too, because it combines a shipping box with an effective point-of-sale display at an over-all saving.

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1 MILLION MORE 4 CUTTING "TEETH"!



Flexible
for contour
finishing.

DURA-CUT ABRASIVE DISCS

(used on right angle portable grinders and disc sanders)

These new flexible discs are $\frac{1}{8}$ " thick while the ordinary coated discs have but a single layer of abrasive. Contrasting such a tremendous amount of additional cutting ability it is easy to understand DuraCut's startling advantages.

- Greater economy.
- Longer life — 15 to 20 times.
- Faster, sustained rate of cut.
- Increased labor savings — less disc changing.
- Safe — strong — resist tearing.
- Available in a wide range of grits, grades and structures — permit control over rate of cut and finish.
- Available in raised hub or flat shapes.



Ask for a demonstration.

Typical applications . . . Blending and finishing of steel, stainless, alloy steel and aluminum welds . . . Removing rust and scale . . . Finishing sheet metal jobs . . . Auto body work . . . Cleaning weld spatters.

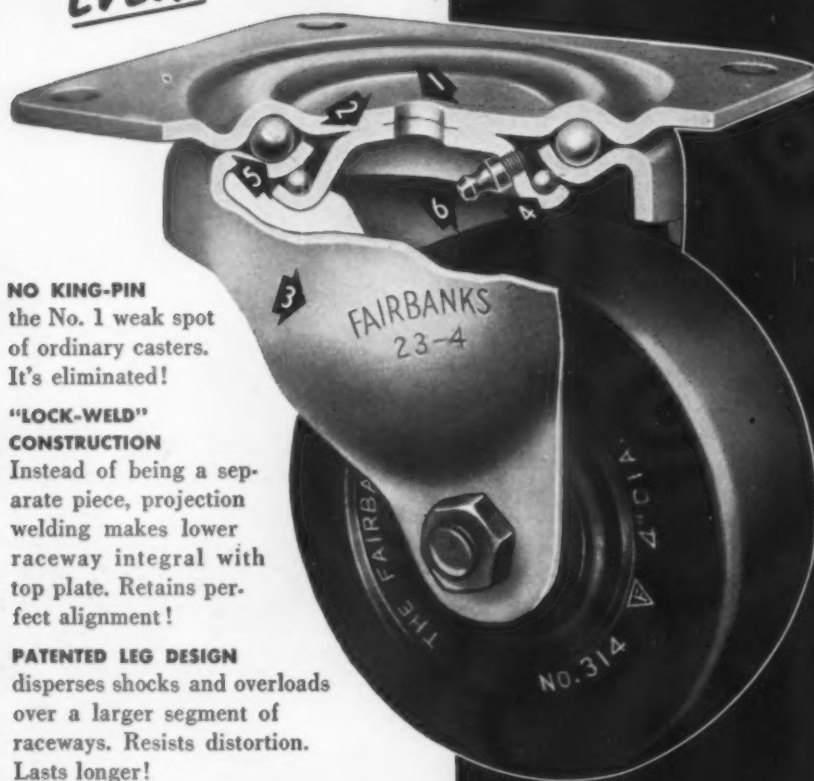


BAY STATE ABRASIVE PRODUCTS CO., Westboro, Mass.
Chicago, Cleveland, Detroit, Pittsburgh • Distributors, All Principal Cities.

NEW Fairbanks Series "23" Double Ball Race SWIVEL CASTER

**STRONGER ON
EVERY POINT**

The NEW Fairbanks Series "23" Double Ball Race Swivel Caster* line is designed for greater load carrying capacity in the medium duty field.



1 NO KING-PIN
the No. 1 weak spot
of ordinary casters.
It's eliminated!

**"LOCK-WELD"
CONSTRUCTION**

2 Instead of being a separate piece, projection welding makes lower raceway integral with top plate. Retains perfect alignment!

3 PATENTED LEG DESIGN
disperses shocks and overloads over a larger segment of raceways. Resists distortion. Lasts longer!

4 LARGER SECONDARY RACEWAY AND BALLS
provide tremendously increased swiveling efficiency and greater shock absorption of overloads. Easier working!

5 COINED RACEWAYS
insure smoother operation through extra hardness. Improve with use!

6 PRESSURE LUBRICATION
by Zerk Fittings reduces friction and wear!

*PATENTED

Rigid Casters, Series
"33" in matching heights

THE

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393 LAFAYETTE STREET • NEW YORK 3, N. Y.
Branches: New York 3 • Pittsburgh 22 • Boston 10 • Rome, Ga.

TRUCKS • VALVES • DART & PIC UNIONS • CASTERS

(Continued from page 134)

Cleveland, O., features better functioning and longer service life through improved design. It combines a flaring pin in a vise slide on a split die block having a series of holes to accommodate $\frac{1}{4}$ ", $\frac{5}{16}$ ", $\frac{3}{8}$ ", $\frac{1}{2}$ " and $\frac{5}{8}$ " tubing. The die blocks are now hardened for longer wear, and a black wrinkle protective coating in place of the cadmium plating offers a positive gripping surface. The flaring pin point has been lengthened to handle heavy-wall tubing in the $\frac{1}{4}$ " size, and the vise screw nose has been modified for quick, self-aligning engagement with the block.

No. 120 — For further information see Page 19

Marking Machines



Noble & Westbrook Manufacturing Co., East Hartford, Conn., is marketing a new line of general purpose machines for trade marking, part numbering, codifying and serial numbering on metal, wood, plastics, etc. They use the company's "roll-marking" process which avoids shock to either the marking die or the piece being marked. It is the same process used to mark such close-tolerance parts as piston rings without straining or distorting them. The all-pneumatic machine will mark up to 1200 pieces an hour, the semi-pneumatic 400 to 650, the hand operated 300 to 500.

No. 121 — For further information see Page 19

Electronic Recorder

Leeds & Northrup Company's new Speedomax electronic recorder features a range continuously adjustable over a 20:1 ratio, and zero suppression adjustable over more than twice the maximum range. Through use of a particular suppressed zero range, an operator can ignore that portion of the range in which he is not interested, while he spreads the few millivolts he wants to watch across the entire width of the instrument chart. Adjustable

(Please turn to page 142)

STOP RUST WITH RUST-OLEUM

Why let rust—the most destructive enemy of American Industry—rob you of expensive, hard-to-replace machines, tanks, stacks, fences, pipe, metal sash, fire escapes, and other valuable equipment?

Use RUST-OLEUM in your plant to protect your property. For 25 years RUST-OLEUM has proved its capacity to stop rust for many nationally known manufacturers. Its tough, pliable, rust-resisting film gives excellent protection that prevents rust losses under many difficult rust-producing conditions—salt air, dampness, industrial fumes, and general weathering.

RUST-OLEUM can be applied even over rusted surfaces. It is not necessary to remove all the rust. Just remove scale and loose

rust by sharp scrapers and wire brushes. You save time and labor on maintenance because no chemical precleaning or sand blasting is usually required.

A qualified RUST-OLEUM specialist will be glad to survey your rust problems and help you develop a program of plant-wide rust control to defer many costly replacements—to conserve the available supply of new metal for national defense.

Industrial Distributors in principal cities of the United States and Canada carry complete stocks for immediate delivery. Plan your needs—order now! See our complete catalog in Sweet's which also tells the nearest source of supply. Or, write on your company letterhead for full information.



Available in many
COLORS
aluminum and white

Beautifies as
it Protects

"RIGID ECONOMY, MON!"

RUST-OLEUM CORPORATION

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Cut motor failures with these two

Don't take our word for it. Here's what users of Life-Lines say: "We always have had bearing failures on our pump motors. It was quite an expense in repair costs and down time. Since we installed Life-Line motors, we have had no down time . . . no failures. We now standardize on Life-Lines."

Another user reports: "Our former starters employed solder pot mechanisms. Much trouble was experienced. Since we've switched to Life-Linestarters,[®] our troubles are gone. The operation of the bimetallic disc is positive."

These reports are two of several hundred such reports resulting from the new kind of dependability built into the Life-Line motor and Life-Linestarter.

Life-Line Motors

Steel frame . . . adds strength, cuts weight.
Pre-lubricated bearings . . . no greasing.
Improved windings . . . lengthen electrical life.

Life-Linestarter

Bimetallic disc . . . calibration unaffected by aging or oxidation.
Servicing is simple . . . all parts removable. Screw driver only tool required.

Get the advantages of these two—your best bet to cut motor failures. Ask your Westinghouse representative for copies of "Life-Line Motor Book", B-3842 and "Tomorrow's Starter Today", B-4677, or write Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania.

J-21644

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Westinghouse

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MOTORS and CONTROLS



PAGE FENCE *-Since 1883*

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Security is vital today as never before. Protection at property lines has been the responsibility of Page Chain Link Fence for more than 60 years. There are fence styles and gates to meet any protective need. The expert erecting firm near you will supply facts and submit cost estimates without obligation. Firm name will be sent with fence data on request.

Write to **PAGE FENCE ASSOCIATION** in Monessen, Pa., Atlanta, Bridgeport, Chicago, Denver, Detroit, Los Angeles, Philadelphia, New York or San Francisco.

PRODUCT OF PAGE STEEL & WIRE DIVISION OF AMERICAN CHAIN & CABLE COMPANY, INC.

(Continued from page 138)
range permits the user to select his own scale calibration at will. Typical measurements include: measurements with strain gages; temperature difference measurements with thermocouples; speed measurements. The company is at 4934 Stenton Ave., Philadelphia 44, Pa.

No. 122 — For further information see Page 19

Fusible Panelboard



Square D's new NTPR panelboards provide plug fusible branches with heavy duty toggle switches for lighting and appliance branch circuit control. They are available from 4 to 40 circuits for use on either a-c or d-c applications. Among the construction features: a 17" wide x 4 1/4" deep box with 4" wide wiring gutters; ample knockouts in the ends and sides. Four branch circuits are contained in the high strength, one-piece molded bakelite blocks which make up the heart of the panelboards. The company emphasizes the low cost of the units. Square D is at P.O. Box 272, Roosevelt Park Annex, Detroit 32, Mich.

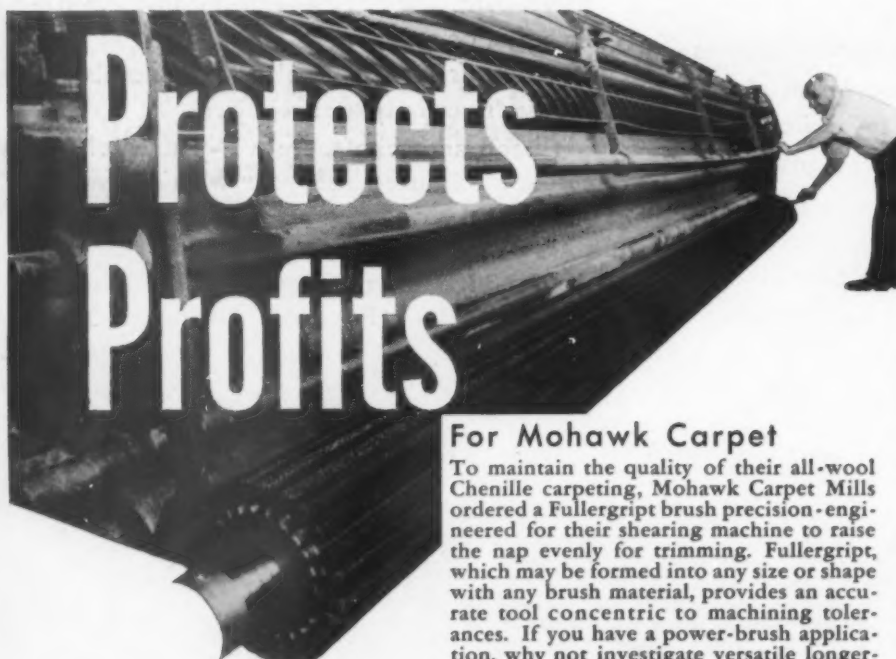
No. 123 — For further information see Page 19

Heat-Resistant Aluminum Paint

Much equipment previously thought "unpaintable" because of temperature limitations can be effectively painted with Heat-Rem H-170, according to Speco, Inc., 7308 Associate Ave., Cleveland 9, O. This aluminum paint will withstand temperatures up to 1700F, it is claimed. Utilizing a silicone base, it fuses with the metal surface immediately upon application. Speco says it forms a bright elastic finish resistant to moisture, corrosion, mild acids, alkalis and industrial fumes. It sets in 4 hours and dries completely overnight on hot surfaces.

No. 124 — For further information see Page 19

(Please turn to page 145)



Power Driven



For Mohawk Carpet

To maintain the quality of their all-wool Chenille carpeting, Mohawk Carpet Mills ordered a Fullergript brush precision-engineered for their shearing machine to raise the nap evenly for trimming. Fullergript, which may be formed into any size or shape with any brush material, provides an accurate tool concentric to machining tolerances. If you have a power-brush application, why not investigate versatile longer-lasting Fullergript? Sold only by Fuller Industrial Representatives. For further information write directly to:

3554 MAIN ST., HARTFORD 2, CONN.

Have you a **plant maintenance problem** that electric tools can solve?

See how these **BLACK & DECKER TOOLS** can speed up your jobs!

WANT to lick your maintenance problems and save money, muscle and man-hours to boot? Put speedy, powerful, durable Black & Decker Tools to work in your plant. You'll be amazed at how they'll make light of your toughest maintenance jobs!

Black & Decker Tools are streamlined, easy to handle—particularly important when you're working in close quarters. Black & Decker Tools are top quality throughout—in materials, workmanship and engineering. And Black & Decker gives you finest service for longer tool life, from any one of 29 *company-owned-and-operated* Service Branches—within 24 hours of your door! See your nearby B&D Distributor for eye-opening demonstrations. Write for free, detailed catalog to: **THE BLACK & DECKER MFG. CO., 664 Pennsylvania Ave., Towson 4, Maryland.**



DRILLING JOBS A HEADACHE? You can't miss with Black & Decker Drills. They give you a choice of capacity—25 models with capacities from $\frac{1}{4}$ " to $1\frac{1}{4}$ " in steel, double in hardwood. They give you a choice of handle arrangement for easiest operation. They give you a choice of speed, power and price in most capacities. For high-speed drilling, boring and hole sawing in all materials, you can't beat world-famous Black & Decker Drills!



GRINDING SLOWING YOU DOWN? Compact, powerful Black & Decker Bench Grinders are your best buy in the field. Their B&D-built "constant speed" motors never let you down. Their streamlined design gives you better working clearance. And they handle a raft of jobs—from grinding down welds and sharpening edged tools to buffing plated metal surfaces and removing rust, scale and corrosion. Choose from four models, 6", 8" and 10" wheel diameters, $\frac{1}{4}$ to 1 H.P.



HAVING TROUBLE DRILLING IN CONCRETE? Black & Decker Electric Hammers pack the punch you need for high-speed drilling and channeling for pipe or conduit in concrete, stone and brick; doing light demolition work; removing scale and rust from tanks or other metal. They deliver thousands of hammer blows per minute. Drive speed bits, star drills, bull points, slotting and scaling tools, chisels. Completely self-contained. Choice of four models.

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MOST COMPLETE
LINE!**

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PORTABLE ELECTRIC **TOOLS**

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YOU WANT LISTED
HERE?

HERE ARE THE POSSIBLE ANSWERS
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THERE ARE FOUR POSSIBLE
ANSWERS: YES, NO, MAYBE,
OR I DON'T KNOW.

HARDENED, TEMPERED AND POLISHED SPRING STEEL
Callouts except as noted.

SAE Grade	Finish	Edge	Weight Per Inch Length	SAE Grade	Finish	Weight Per Inch Length
A307	1/4"	Square	24.00	A307	1/4"	24.00
A307	3/16"	Square	10.43	A307	3/16"	10.43
A307	1/8"	Square	6.59	A307	1/8"	6.59
A307	1/4"	Round	1.86	A307	1/4"	1.86
A307	3/16"	Round	1.86	A307	3/16"	1.86
A307	1/8"	Round	2.04	A307	1/8"	2.04
A307	1/4"	Flat	2.52	A307	1/4"	2.52
A307	3/16"	Flat	2.79	A307	3/16"	2.79
A307	1/8"	Flat	2.79	A307	1/8"	2.79
A307	1/4"	Flat	3.72	A307	1/4"	3.72
A307	3/16"	Flat	3.72	A307	3/16"	3.72
A307	1/8"	Flat	3.72	A307	1/8"	3.72
A307	1/4"	Flat	4.65	A307	1/4"	4.65
A307	3/16"	Flat	4.65	A307	3/16"	4.65
A307	1/8"	Flat	4.65	A307	1/8"	4.65
A307	1/4"	Flat	5.58	A307	1/4"	5.58
A307	3/16"	Flat	5.58	A307	3/16"	5.58
A307	1/8"	Flat	5.58	A307	1/8"	5.58
A307	1/4"	Flat	6.51	A307	1/4"	6.51
A307	3/16"	Flat	6.51	A307	3/16"	6.51
A307	1/8"	Flat	6.51	A307	1/8"	6.51
A307	1/4"	Flat	7.44	A307	1/4"	7.44
A307	3/16"	Flat	7.44	A307	3/16"	7.44
A307	1/8"	Flat	7.44	A307	1/8"	7.44
A307	1/4"	Flat	8.37	A307	1/4"	8.37
A307	3/16"	Flat	8.37	A307	3/16"	8.37
A307	1/8"	Flat	8.37	A307	1/8"	8.37
A307	1/4"	Flat	9.30	A307	1/4"	9.30
A307	3/16"	Flat	9.30	A307	3/16"	9.30
A307	1/8"	Flat	9.30	A307	1/8"	9.30
A307	1/4"	Flat	10.23	A307	1/4"	10.23
A307	3/16"	Flat	10.23	A307	3/16"	10.23
A307	1/8"	Flat	10.23	A307	1/8"	10.23
A307	1/4"	Flat	11.16	A307	1/4"	11.16
A307	3/16"	Flat	11.16	A307	3/16"	11.16
A307	1/8"	Flat	11.16	A307	1/8"	11.16

**Thicknesses
From .020" to .024"**

**Thicknesses
From .001" to .006"**

SAE Grade	Finish	Edge	Weight Per Inch Length	SAE Grade	Finish	Weight Per Inch Length
A307	1/4"	Square	24.00	A307	1/4"	24.00
A307	3/16"	Square	10.43	A307	3/16"	10.43
A307	1/8"	Square	6.59	A307	1/8"	6.59
A307	1/4"	Round	1.86	A307	1/4"	1.86
A307	3/16"	Round	1.86	A307	3/16"	1.86
A307	1/8"	Round	2.04	A307	1/8"	2.04
A307	1/4"	Flat	2.52	A307	1/4"	2.52
A307	3/16"	Flat	2.79	A307	3/16"	2.79
A307	1/8"	Flat	2.79	A307	1/8"	2.79
A307	1/4"	Flat	3.72	A307	1/4"	3.72
A307	3/16"	Flat	3.72	A307	3/16"	3.72
A307	1/8"	Flat	3.72	A307	1/8"	3.72
A307	1/4"	Flat	4.65	A307	1/4"	4.65
A307	3/16"	Flat	4.65	A307	3/16"	4.65
A307	1/8"	Flat	4.65	A307	1/8"	4.65
A307	1/4"	Flat	5.58	A307	1/4"	5.58
A307	3/16"	Flat	5.58	A307	3/16"	5.58
A307	1/8"	Flat	5.58	A307	1/8"	5.58
A307	1/4"	Flat	6.51	A307	1/4"	6.51
A307	3/16"	Flat	6.51	A307	3/16"	6.51
A307	1/8"	Flat	6.51	A307	1/8"	6.51
A307	1/4"	Flat	7.44	A307	1/4"	7.44
A307	3/16"	Flat	7.44	A307	3/16"	7.44
A307	1/8"	Flat	7.44	A307	1/8"	7.44
A307	1/4"	Flat	8.37	A307	1/4"	8.37
A307	3/16"	Flat	8.37	A307	3/16"	8.37
A307	1/8"	Flat	8.37	A307	1/8"	8.37
A307	1/4"	Flat	9.30	A307	1/4"	9.30
A307	3/16"	Flat	9.30	A307	3/16"	9.30
A307	1/8"	Flat	9.30	A307	1/8"	9.30
A307	1/4"	Flat	10.23	A307	1/4"	10.23
A307	3/16"	Flat	10.23	A307	3/16"	10.23
A307	1/8"	Flat	10.23	A307	1/8"	10.23
A307	1/4"	Flat	11.16	A307	1/4"	11.16
A307	3/16"	Flat	11.16	A307	3/16"	11.16
A307	1/8"	Flat	11.16	A307	1/8"	11.16

Sandvik's catalog lists 652 sizes of hardened and tempered spring steel normally available. Even if the size you require is not available, in all probability, a reasonably satisfactory substitute can be offered.

In addition, the catalog lists 133 cold-rolled and bright annealed sizes that are also usually carried in stock.

These days, anyone who buys or specifies spring steel should have this quick and easy reference to Sandvik's stock on his desk.

It's yours for the asking. Use the coupon or drop a note on your letterhead.

SOME SANDVIK SPECIALTY STRIP STEELS
Band Saw Steels; Wood Band, Butcher Band and Metal Band • Steel for Textile Machine Parts • Camera Shutter Steel • Clock and Watch Spring Steels • Compressor Valve Steel • Doctor Blade Steel • Feeler Gauge Steel • Razor Blade Steel • Reed Steels • Shock Absorber Steel • Sinkers Steel • Spring Steels • Trowel Steel • Vibrator Reed Steel, etc.



SANDVIK STEEL, INC.
111 EIGHTH AVE., N.Y. 11, WA 9-7180
230 N. Michigan Ave., Chicago 1, FR 2-5638
1736 Columbus Rd., Cleveland 13, CH 1-2303
SANDVIK CANADIAN LTD.
426 McGill St., Mont., Can.

SS-70



SANDVIK STEEL, INC.
111 Eighth Ave., New York 11, N. Y.

Please send me my free copy of your Spring Steel Catalog.

Name _____ Title _____

Company _____

Address _____

City _____ State _____

Giant Fire Extinguisher



All 350 pounds of dry chemical contained in this giant Alfco wheeled portable engine can be discharged in one minute and fifteen seconds if necessary to smother fires of considerable proportions. The unit, for use on flammable liquid and electrical type industrial fires, uses dry nitrogen as an expellent, which provides a sustained operating pressure of 200 psi during the entire period of discharge. The maker, American-LaFrance-Foamite Corporation, Elmira, N. Y., says the engine is the largest of its kind now available, but can be handled easily by two men. Density of the dispersion of the discharge cools and insulates the operator. Discharge range is from 20 to 25 feet.

No. 125 — For further information see Page 19

Bag Flattener And Pallet Loader



Flexoveyer Manufacturing Company has brought out a bag flattener that can also be used as a pallet loader. The discharge conveyor section is raised and lowered by means of a hydraulic ram so that bags can be piled on pallets and follow the height of the tier. This cuts down on labor and permits formation of a more stable load. A series of endless steel coil springs running over grooved steel rollers forms the conveying medium. By means of a tension spring and a rocker arm connection between the upper and lower conveyors, a "kneading and

(Please turn to page 148)



*They're
calling him
"Mr. Genius"
now!*

More production per grinding wheel dollar. That's why George is the boss's brainy boy. How did he get that way? Simply by changing over to a grinding wheel slightly different in grain and grade . . . a Simonds wheel, naturally. This could be a right, bright production boosting idea for you too. You'll find everything you need in our complete line . . . grinding wheels, mounted wheels and points, segments, abrasive grains. Let's send you our free Data Book and the name of your nearby Simonds Abrasive Company distributor.



SIMONDS ABRASIVE COMPANY, PHILADELPHIA 37, PA.

DISTRIBUTORS IN ALL PRINCIPAL CITIES

Division of Simonds Saw and Steel Co., Fitchburg, Mass. Other Simonds Companies: Simonds Steel Mills, Lockport, N. Y., Simonds Canada Saw Co., Ltd., Montreal, Que. and Simonds Canada Abrasive Co., Ltd., Arvida, Que.

"WE WERE LOSING 5 KILN MOTORS PER MONTH UNTIL WE CHANGED TO FUSETRON dual-element FUSES."

Malvin E. Adams,
Electrician

OZARK HARDWOOD COMPANY

PHONE 252

CLARKSVILLE, ARKANSAS
April 20, 1950

JOE B. MILLS, MANAGER

Bussmann Manufacturing Co.

St. Louis, Missouri

Dear Sir:

I have found a great savings in your Fuzetrons.

Two and one-half years ago I started changing my Dry Kiln motors to Fuzetron protection. Up until I changed completely I was losing an average of 5 motors per month which was very expensive. I was having to fuse my motors too heavy to pick up the load, then if something went wrong the fuses were too heavy and held the motor on the line, therefore burning it up.

My Kiln motors are $1\frac{1}{2}$ h.p. 5 amp. I fuse them with 5 amp fuzetron. The fuzetron will hold this starting load and when it picks up I still have motor protection if anything goes wrong the fuzetron will blow in time to keep the motor from burning up. I fuse my main pannell with 6 - 600 amp. fuzetron. I used to blow fuses on this until I changed to fuzetron, therefore, taking care of the surging load.

I have approximately 800 h.p. I fuse almost all the plant on fuzetron. My trouble has been very light since changing to fuzetron for motor protection. Fuzetron is tops with me.

Yours very truly,

Malvin E. Adams
Malvin E. Adams
Electrician



FUSETRON

TRUSTWORTHY NAMES IN
ELECTRICAL PROTECTION

BUSS

Fusetron DUAL ELEMENT Fuses

Give 10 Point Protection

- 1 ★Protect against short circuits.
- 2 Protect against needless blows caused by harmless overloads.
- 3 Protect against needless blows caused by excessive heating — lesser resistance results in much cooler operation.
- 4 Provide thermal protection — for panels and switches against damage from heating due to poor contact.
- 5 Protect motors against burnout from overloading.
- 6 Protect motors against burnout due to single phasing.
- 7 Give **DOUBLE** burnout protection to large motors — without extra cost.
- 8 Make protection of small motors simple and inexpensive.
- 9 Protect against waste of space and money — permit use of proper size switches and panels.
- 10 Protect coils, transformers and solenoids against burnout.

★ Fusetron Fuses have high interrupting capacity as shown by tests of the Electrical Testing Laboratories of New York City in December 1947.



What is the FUSETRON Dual-Element FUSE?

A fuse link combined with a thermal cut-out — the result, a fuse with tremendous time-lag and much less electrical resistance.

They have the same degree of Underwriters' Laboratories approval for both motor-running and circuit protection as the most expensive devices made.

Made to same dimensions as ordinary fuses, FUSETRON Fuses fit all standard fuse holders.

Obtainable in all sizes from 1/10 to 600 ampere, both 250 and 600 volt types. Also in plug types for 125 volt circuits.

Their cost is surprisingly low.

Fusetron is a trade mark of Bussmann Mfg. Co., Division of McGraw Electric Co.

Don't risk losses in your plant!

One **lost** motor,
One **needless** shutdown,
One **destroyed** panel or switch,
One **burned out** solenoid —
May cost you more than replacing every ordinary fuse with a FUSETRON dual-element fuse.

Bussmann Mfg. Co., University at Jefferson, St. Louis 7, Mo. (Division McGraw Electric Co.)

Please send me complete facts about FUSETRON Dual-Element FUSES.

Name

Title

Company

Address

City State 351



HACK SAWS



BAND SAWS

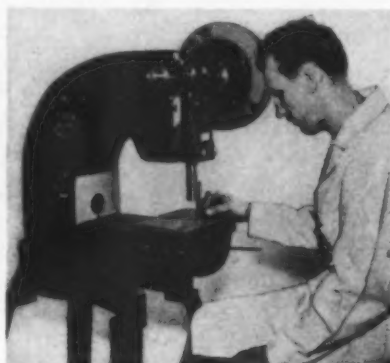


GROUND FLAT STOCK

AMERICAN SAW
& MFG. COMPANY
SPRINGFIELD 1, MASS.
"The Tools in the Plaid Box"

(Continued from page 145)
pressing action" is applied to the bag, eliminating air and distributing contents evenly. The company says bags pile better and up to 30% space saved. Flexoveyer is at 1220 S. Acoma St., Denver, Colo.
No. 126 — For further information see Page 19

4-in-1 Punch Press



Kenco Manufacturing Co., 5211 Anaheim-Telegraph Rd., Los Angeles, Calif., has brought out a 4-in-1 four ton punch press. An adjustable bed permits quick conversion from the standard press to long punch, half or horn press. Among the features of the press are: a deep, 12 3/4" throat; a sturdy, 400 lb. cast frame and patented clutch drive dog built into the clutch collar instead of a slot in the crankshaft. Special trip mechanism permits the operator to change from single to continuous ramming without stopping the press.

No. 127 — For further information see Page 19

Lubricator



C. A. Norgren Co., 222 Santa Fe Drive, Denver 9, Colo. has announced a new development in oil-fog lubricating. The Micro-Fog lubricator develops a true fog in which extremely minute and uniform size particles of lubricant remain in suspension in the air stream. Among the basic advantages of the new principle are: fog can

be carried to far greater distances than in conventional lubricators; it can be uniformly distributed through several outlets; it effects more thorough lubrication; ends flooding of lines or equipment; is fully automatic; features visible oil feed and supply. Wide range of models for large variety of uses available.

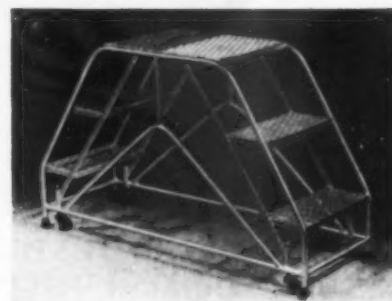
No. 128 — For further information see Page 19

Corrosion-Resistant Tubing

The Carpenter Steel Co., Alloy Tube Divn., Union, N. J. offers tubing and pipe to handle a variety of oxidizing and reducing corrodents. Called Alloys B and C, they are made from strip of the "Hastelloy" analyses, trademarked products of the Haynes Steel Division of Union Carbide and Carbon Corporation. Alloy B tubing or pipe is unusually resistant to hydrochloric acid in all concentrations and at all temperatures. It is also recommended for sulphuric acid at temperatures above 80C. Alloy C will withstand strong oxidizing conditions, such as those encountered with nitric acid, free chlorine, aqueous solutions of chlorine, and acid solutions of ferric and cupric salts. It will also resist phosphoric acid and is highly resistant to acetic, formic, and sulphuric acids.

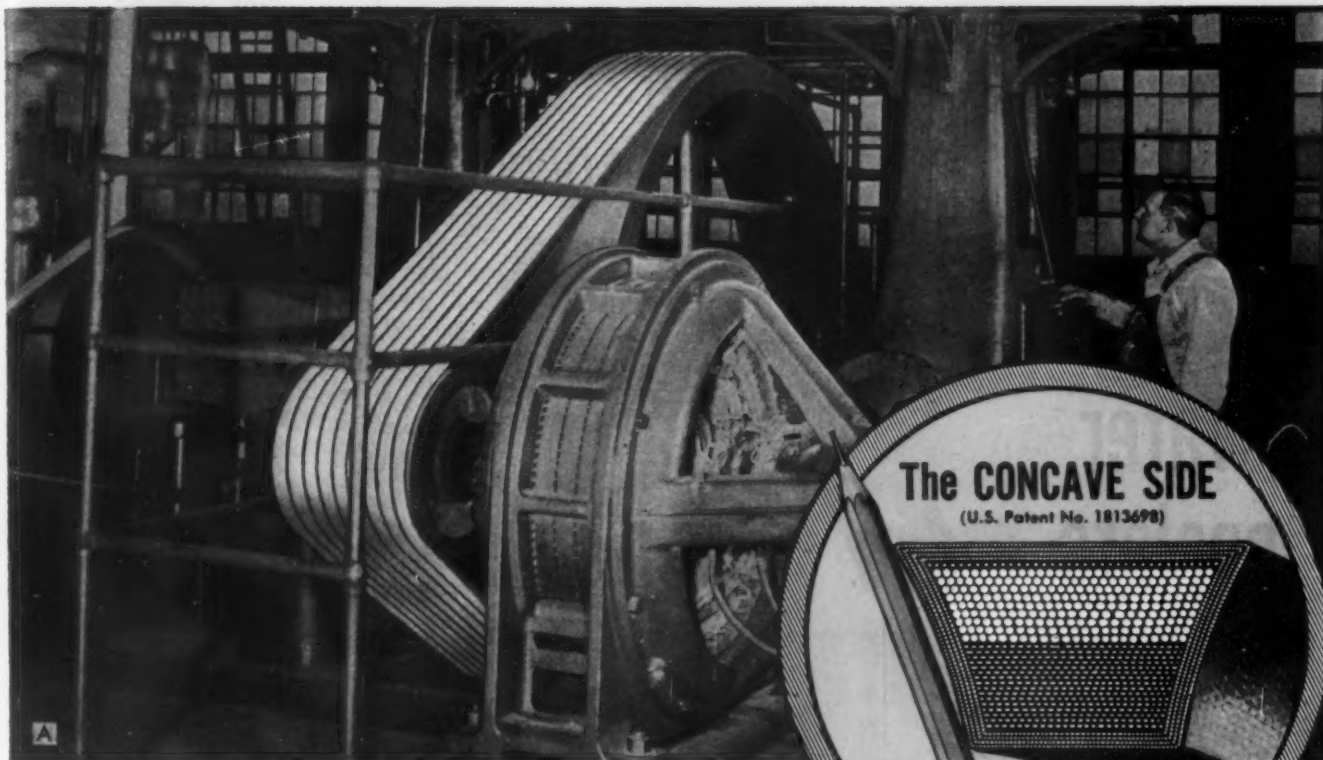
No. 129 — For further information see Page 19

Safety Ladder



On large assembly jobs, in stock room aisles and many other places, two or more people can use this new safety ladder at one time. With no one on the ladder, it rolls easily on swivel casters. When a person gets on, however, his weight causes the spring mounted casters to deflect so that rubber-tipped legs engage the floor and the ladder will not roll. The frame is of welded tubular steel. Steps are expanded steel, with non-slip surface. The ladder is 30" high, 17 1/2" wide and 48" deep. The top step has a 20" tread, others a 7" tread. Called Model 3-SA, it is made by the Ballymore Co., 139 Pennsylvania Ave., Wayne, Pa.

No. 130 — For further information see Page 19
(Please turn to page 150)



The City Ice and Cold Storage Co., of Kansas City, Kansas, saved much space with this very compact Vulco Rope Drive on the huge compressor shown. Mr. H. L. Frentrup, Chief Engineer, says of this Drive: "It has been in operation for 17 years and the original Gates belts still look good for many years of service."

This Simple Test Tells WHY the Concave Sides of Gates Vulco Ropes Mean Longer Belt Life!

Prove this yourself—in two minutes' time.

Take any V-belt that has *straight* sides. Bend that V-belt while you grip its sides between your fingers and your thumb. You will feel the sides of the belt *bulge out*—as shown in figure 1-A, below.

Clearly, that outbulge forces the sides of the belt to press *unevenly* against the V-pulley—and this concentrates the *wear* where the bulge is greatest.

Now, make the same test with the belt that is built with the Concave Sides—the Gates Vulco Rope.

Figures 2 and 2-A show clearly what happens when you bend a Vulco Rope. Instead of *bulging*, the precisely engineered Concave Sides merely *fill out* and become perfectly straight. There is no side-bulge. This belt, when bent, precisely fits its sheave groove.

Because there is *no bulging*, the sides of the Gates Vulco Rope always grip the *full face* of the V-pulley *evenly* and therefore wear uni-

formly—resulting in *longer belt life* and *lower belt costs* for you.

Only V-belts made by Gates are built with concave sides. Whenever you buy V-belts, be sure that you get the V-belt with the Concave Sides—The Gates Vulco Rope!

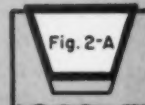
What Happens When a V-Belt Bends

Straight-Sided V-Belt



How Straight-Sided V-Belt Bulges in Sheave-Groove. Sides Press Unevenly Against V-Pulley Causing Extra Wear At Point Shown by Arrows.

Gates Vulco Rope with Concave Sides



The Concave Sides Fill Out to a Precise Fit in the Sheave-Groove. No Side Bulge! Sides Press Evenly Against the V-Pulley—Uniform Wear—Longer Life!

CS-511

THE GATES RUBBER COMPANY

DENVER, U. S. A.

The World's Largest Makers of V-Belts

Gates

VULCO
ROPE

DRIVES

Engineering Offices
and Jobber Stocks

IN ALL INDUSTRIAL CENTERS

of the U. S. and 71
Foreign Countries

Your employees will like
the sanitary new
G-E Water Cooler!



**water
coolers**



STAINLESS-STEEL TOP—Its handsome, satin-smooth Tampico Brush finish is easy to keep clean. Scientifically designed to prevent spillage. Sanitary—no crevices or corners to collect bacteria.



ANGLE STREAM, NON SQUIRT BUBBLER—Stream angled to avoid water dripping back on nozzle from lips.



ASK your local G-E dealer for advice on your water cooler requirements. Look for his name in the classified pages of your telephone book.



SURE-TREAD FOOT PEDAL CONTROL—Easy to use—permits drinking when hands are full. Sanitary—avoids transfer of germs from user's hands to bubbler.



DIAL THE WATER TEMPERATURE YOU WANT—Control knob easily reached behind removable front panel, yet concealed against tampering. Set it and forget it.

FREE! 24-PAGE BOOK!

General Electric Company, Section P-3
Air Conditioning Department
Bloomfield, New Jersey

Please send without obligation to me the fully illustrated book, "Water at Work."

NAME.....

COMPANY.....

ADDRESS.....

CITY.....ZONE.....STATE.....

You can put your confidence in—

GENERAL  ELECTRIC

Tiny Tacker



Tiny as a toy, yet efficient as a large industrial staple tacker is the way Heller Company, Cleveland 14, O., describes its new pocket-size tool for use in wire installations. The tacker staples braided, rubber-coated, single and double strand wire and hollow tube lines. Front and rear guides circle the wire and permit rapid drawing around difficult angles or corners, along baseboards, window frames, etc. The staples, made in several colors, easily penetrate plaster, composition, hard and soft woods (with holding power up to 64 lbs.). Staple is driven to desired depth without hurting the wire.

No. 131—For further information see Page 19

Punch Press



This 24"-throat Model 18B punch press will handle sheet material up to 48" wide. Another feature, the rotary turret, permits the operator to locate any one of 18 punch sizes almost instantly. It rotates to the size wanted, and locks in position automatically. The machines are always ready to operate. The 18 punch stations can be furnished on the standard model turret in 5/64" to 2" sizes, and operate efficiently on cardboard, fibreboard, plastic or sheet iron up to 10-gage thickness.

(Please turn to page 154)

*Why
look
further?*

when Powell can supply
you with every kind of
valve you may need!

The Complete Line includes valves
in Bronze, Iron, and Steel and the
greatest variety of Corrosion-Resisting
metals and alloys ever used in making
industrial flow control equipment.

*Quality line
throughout
the line*

Fig. 41121, A 1500-psi. Cast Steel Pressure
and Class Valve for Power Plant service. The
valve is made of steel and has a cast steel
body and a cast steel valve. The valve is
made of steel and has a cast steel body and
a cast steel valve.

POWELL

The WM. POWELL CO., 2525 Spring Grove Ave., P. O. Box 106, Station B, Cincinnati 22, Ohio



TEMPERATURES UP TO 110°!

WINDS UP TO 120 MPH!



Rome Cable Can Meet Your Toughest Cable Requirements

If you're looking for a cable to meet tough requirements, Rome Cable has the answer. Why? Because Rome has the ability through competent engineering and research, to design the *right cable for the job*, and the manufacturing facilities to produce it.

For example, a well-known Middle East oil company had the problem of a sensitive, long-distance, remote control operation. The installation involved both aerial and direct earth burial circuits requiring matched performance. Long-time stability of electrical characteristics, sensitivity of operation, and resistance to extreme weather were essential. Rome Cable was specified for the job because of its ability to design and make *exactly the cable needed* . . . a cable that would more than meet the service conditions involved.

Whatever your cable problem, let Rome solve it for you. The coupon below will bring you the informative book, "The Story of Rome Cable Corporation." It will convince you of Rome Cable's ability to meet your most difficult requirements with cable that will give years of efficient, trouble-free service.

IT COSTS LESS TO BUY THE BEST

ROME CABLE CORPORATION, Dept. P-3, Rome, N. Y.
Please send me a complimentary copy of "The Story of Rome Cable Corporation."

Name Title

Firm Address

City Zone State

ROME CABLE

Corporation

ROME • NEW YORK

From Bar to Finished Wire



Every Air Hose With This Trademark

Assures Long Operating Life



Air hose economy is not measured in feet per dollar. The only true yardstick of air hose value is *service hours*.

Because every BWH hose has been developed,

tested and field-proven to give the best possible combination of strength, safety, flexibility and damage resistance . . . *you get maximum service life.*

Whatever brand of hose you are now buying, you are paying for BWH benefits — so why not start getting them — *now?*

Today, contact your nearby BWH Distributor.

CONCORD AIR



An extra quality, exceptionally rugged hose for toughest use on air drill and pneumatic service in mines, quarries and construction jobs. Non-porous tube resists heat and oil. High tensile cotton yarn braid reinforce carcass. Tough grey cover resists cutting, gouging, abrasion. 7 sizes from 1/2" 2-braid through 2" 3-braid. 200 to 300 lbs. working pressure. Maximum length 50'.

BAY STATE AIR DRILL



For heavy construction work in mines, quarries, tunnels and wherever large size hose is required for long service. Smooth black tube resists heat and oil. Carcass of strong, rubber-impregnated multiple ply woven duck. Rugged, heavy-gauge red rubber cover resists severe weather extremes, cutting, abrasion. 9 sizes stocked from 1/2" to 4". Working pressures from 175 to 225 lbs. Maximum length 50'.

AUROCHS AIR



For portable air compressors, jackhammers, rugged industrial and construction work. Smooth, black, non-porous tube resists heat and oil. Carcass: multiple ply, rubber-impregnated, rugged woven fabric. Tough black cover resists weather and abrasion. Stocked sizes: 1/2", 3/4", 1", 200 lbs. working pressure. Maximum length 50'.

TIGER AIR



Lightweight, flexible hose for general industrial and medium air service. Smooth black tube resists oil and heat. Carcass is strong, lightweight multiple ply woven fabric. Tough, black cover resists abrasion. Stocked sizes: 3/8", 1/2", 3/4", 150 lbs. working pressure. Maximum length 50'.

VIM AIR



For general industrial use, on compressors and pneumatic tools. Black tube resists oil and heat. Husky cotton yarn braids. Smooth, red cover resists weather, abrasion. 8 sizes stocked, 1/4" 2-braid to 1" 3-braid. Working pressures 150 to 225 lbs. Maximum length 500'.

BULL DOG VARI-PURPOSE AIR



For a variety of jobs including handling of air, water, oil, gasoline, kerosene (not for paints, lacquers, lacquer-solvents). Black, synthetic tube resists oil and heat. Carcass is braided rayon cord, high strength, super flexible. Smooth, brown, tough synthetic cover resists oil, abrasion, sunlight. 11 sizes stocked from 3/16" one-braid to 1" 2-braid. Working pressures: 200 to 300 lbs. Maximum length approximately 500'.

BWH



DEPENDABLE RUGGEDNESS

BOSTON WOVEN HOSE & RUBBER COMPANY

Distributors in all Principal Cities

PLANT: CAMBRIDGE, MASS. • P. O. BOX 1071, BOSTON 3, MASS., U. S. A.

From Air Conditioning To

Atomic Research THESE SMALL SWITCHES ARE DOING A BIG JOB



Series 240
Rotary Switches

... now available in over 30 circuit variations for heater, motor and low-voltage A.C. electronic applications



Brand new only a few months ago, today in dozens of products, both civilian and defense, Series 240 Switches are proving the value of their exclusive combination of features:

- **Compactness** — unmatched by any comparable switch: base only 1½" high, 1¼" wide, 1" deep. Available in single hole mounting and bezel equipped models. Latter snaps into mounting hole for fast assembly with spring clips holding it firm.
- **Heat Resistance** — completely efficient operation with ambient temperatures up to 400° F.
- **Entirely Enclosed** — for safety, and protection of working parts.

- **High Overload Capacity** — ratings are conservative: 7½ A, 240 V; 15 A, 120 V; 25 A, 120-240 V; 1 H.P., 120 V; 2 H.P., 240 V. A.C. only. Underwriters' Laboratories Approved.

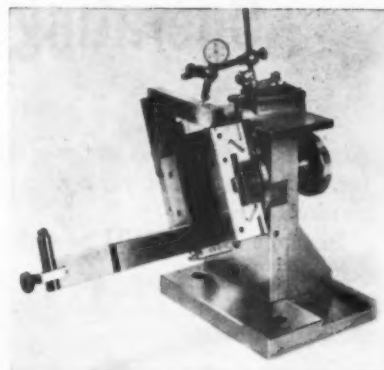
- **Peak Performance and Long Service Life** — thanks to ingeniously simple design, rugged construction, heavy silver contacts and long recognized "Diamond H" slow-break principle.

Write today for complete details on how Series 240 Switches will meet your needs.

THE HART MANUFACTURING COMPANY
213 BARTHOLOMEW AVENUE, HARTFORD, CONNECTICUT

(Continued from page 150)
Dies and punches are accurately aligned, but independent rotation of turret and die plate increases versatility of the press. Safety lock prevents damage to work, punches, or dies if machine is not properly aligned. Made by Rotex Punch Co., 4726 E. 12th St., Oakland, Calif.
No. 132 — For further information see Page 19

Wheel Dresser



Universal Form Tool Co., 7410 Rutherford, Detroit 28, Mich., has brought out a new wheel dresser capable of dressing a complete form, rather than a single radius and angle tangent. This is made possible through movements in the column and base with gauge block applications. The angles may be set with sine bar in addition to graduations. The dresser may be used under the wheel or at the side and all settings may be made without removing from machine. Universal says it is the only dresser made that can complete an entire form with all locations held.

No. 133 — For further information see Page 19

Barrel Tilter



Fast, safe pouring of acids and other liquids from stainless steel barrels is provided with this safety tilter and pouring spout. The cradle and supporting base of the tilter are

(Please turn to page 156)



**Well-Known Maker of
Electric Hand Saws
CUTS COSTS!**

With **ZIP-GRIP®**
Self-Locking
SET SCREWS

**Send for FREE DEMONSTRATOR and
DATA Sheet**—that tells why ZIP-GRIP®
is successfully solving the puzzling set
screw problems of this and over a
hundred other products.

The manufacturer of this hand saw
found that other screws were too slow,
or expensive to assemble and did not
give a tight enough fit. ZIP-GRIP®
solved the problem and also resulted
in a reduction in cost. Write today
and we'll tell you how to get Free
Engineering Test Samples for your
application, without cost or obligation
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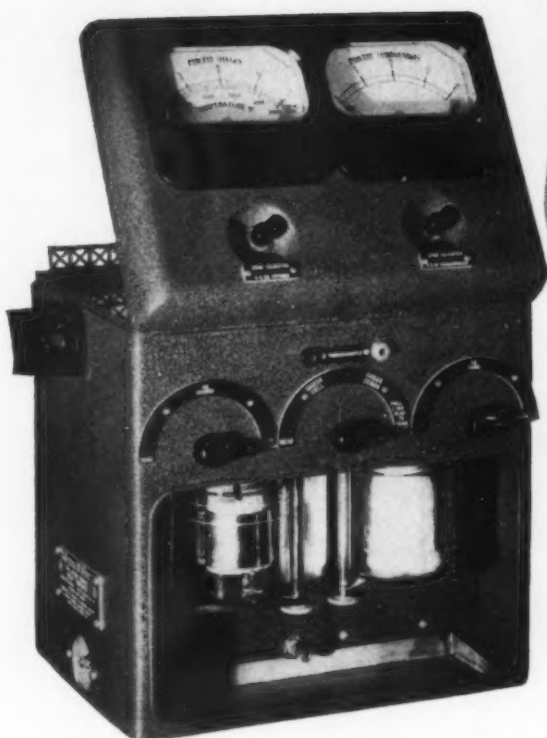
*PAT. PENDING



**Set
Screw
& Mfg. Co.**

142 Main St. Bartlett, Ill. (Chicago suburb)

We specialize in Solving Puzzling Set Screw Problems.



**Not an instrument you buy,
but a service we supply.
Write or call us today.**

**THE COMPLETE CITIES SERVICE LINE FOR THE
METAL FABRICATING INDUSTRY INCLUDES**

Chillo Cutting Oils
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Combustion Facts Fully Revealed by Fast, Simple Heat Prover Test

This scientific combustion analyzer—the Cities Service Heat Prover—gives you the real “inside” on furnace combustion conditions. Its plain, quick, accurate work lets you know:

How much excess oxygen is present
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Without endless trial-and-error you can proceed to conserve fuel and increase furnace output. This is substantiated by records made on all types of furnaces. See for yourself how productivity can be improved. Call or write *today* for a Cities Service Heat Prover demonstration... readily arranged in your plant. Or for further details return the coupon below.



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Sixty Wall Tower, Room 883
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Without obligation please send your booklet, “Combustion Control for Industry” and Heat Prover information.

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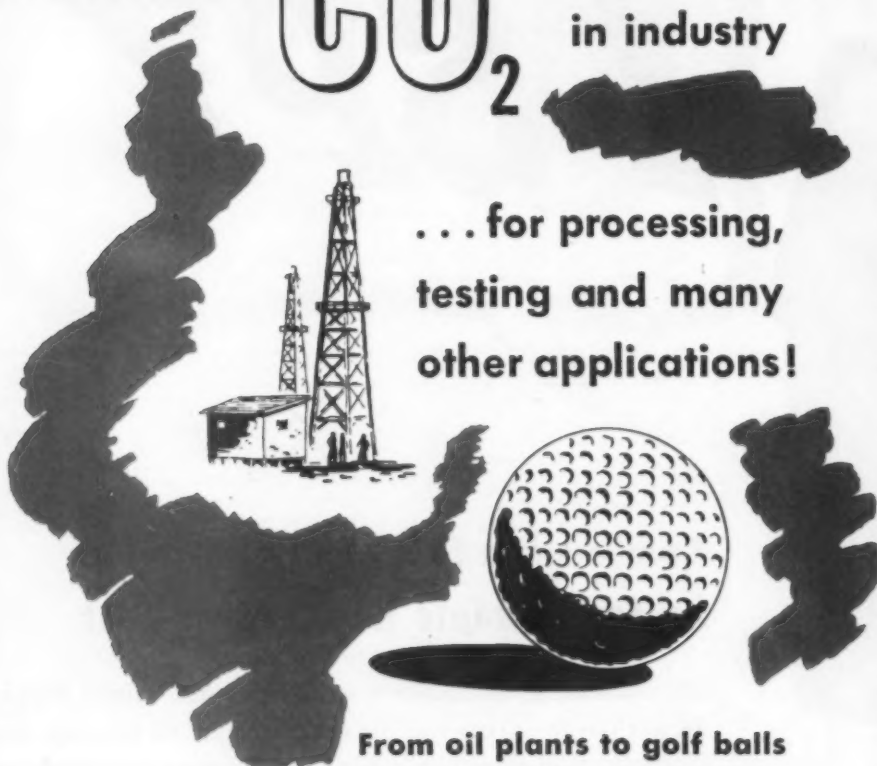
City and State

**RED
DIAMOND**

CO₂

—the gas of a
thousand uses
in industry

... for processing,
testing and many
other applications!



From oil plants to golf balls

— Carbon Dioxide is invaluable in endless ways. As a basic ingredient in chemical processing, as a low temperature refrigerant of minus 110° F., as an inert gas and as a pressure medium, CO₂ is playing an important role in production, transportation and laboratory testing. RED DIAMOND CO₂ provides a high degree of dependable purity for every use.

Liquid offers convenient sources of supply through plants and warehouses across the nation.

CO₂

IN ALL ITS FORMS

**GAS
LIQUID
SOLID**

by



WORLD'S LARGEST PRODUCER OF CO₂

Write for a free copy of "A CHART OF INDUSTRIAL USES". It shows over 60 specific uses and suggests many more. Complete technical service available.

**A National Network of Service — 28 Producing Plants
Over 70 Distributing Plants in U.S.A.**

THE LIQUID CARBONIC CORPORATION

3110 South Kedzie Avenue, Chicago 23, Illinois

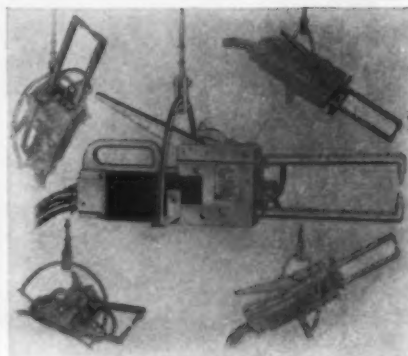
Producing Plants and Warehouses in Principal Cities of the United States and Canada

(Continued from page 154)

made of structural steel, and all members are riveted or welded. Ratchet-type locking device permits the filter to be held firm so that entire operation can be done by one man. Safety air vent, made of acid resistant rubber and plastic tubing, eliminates spurts and splashes from flow of liquid. Filter can be safely left in position just above the flow of liquid, saving time and motion when several small containers are being filled in succession. It is made by General Scientific Equipment Co., 2700 W. Huntingdon St., Philadelphia 32, Pa.

No. 134 — For further information see Page 19

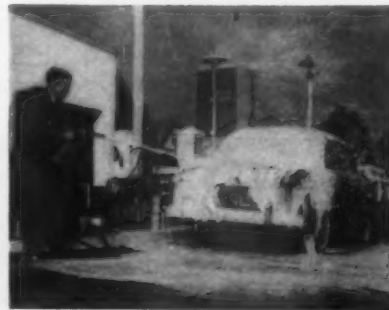
Spot Welder



The four convenient suspended positions illustrated show how easily inexperienced operators can use its new 10 KVA and 20 KVA portable "spot" welder, says Miller Electric Mfg. Co., Appleton, Wis. The welder is equipped with a ball bearing suspension ring, but Miller states it is still low enough in cost compared to the conventional gun type "spot" welder to be used by even the smallest sheet metal shop or manufacturing plant. It weighs approximately 80 lbs.

No. 135 — For further information see Page 19

Foam Unit



National Foam System, Inc., West Chester, Pa., says its Aer-O-Foamster produces as much or more foam than the old-fashioned 40-gal- (Please turn to page 158)

C
ONSERVATION
M
AINTENANCE
P
LAN
by

QUAKER

**HOW TO GET
More Production...
Less Maintenance**

**QUAKER'S COMPLETE PLAN FOR
LONGER PRODUCTIVE LIFE FROM
INDUSTRIAL RUBBER PRODUCTS**

GET YOUR COPY

of this big factual booklet and other helpful data of the QUAKER C M P program. No charge, no obligation. Yours to help you get more out of industrial rubber products.

Now, to meet the need to produce more with less, put the QUAKER Conservation Maintenance Plan to work in your operations.

Developed by Quaker Engineers to help you get more production out of your industrial rubber products, with less maintenance, this plan is practical and easily applied by any man on the job.

QUAKER C M P includes a big factual booklet on how to make conveyor and transmission belting, hose and packings last longer. Charts are available for bulletin boards. Technical bulletins will be issued periodically to you with the latest conservation and maintenance data. It's a complete plan that will help every man in your operations to conserve... will reduce maintenance... and increase production.

From the air hose on the drill to the belt conveying materials, the QUAKER Conservation Maintenance Plan will help you save time, material and money. Put this practical plan to work immediately! Write today for full details.



QUAKER RUBBER CORPORATION
DIVISION OF H. K. PORTER COMPANY, INC.

PHILADELPHIA 24, PENNA. BRANCHES IN PRINCIPAL CITIES



Style No. L2
With Nylon Caps

**One Source For All Your
Eye Protection Needs**

WILLSON

Style No. CC60
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For Heavy Duty

Style No. DL48
For Hot Jobs

WILLSON
Dependable Products Since 1870
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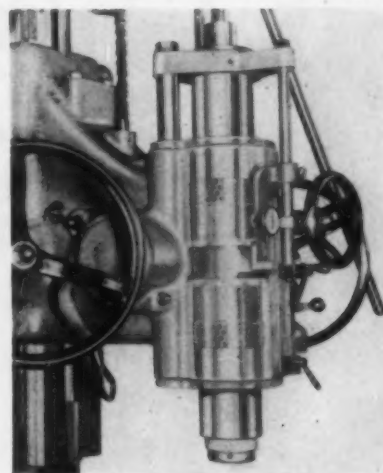
Comfort • Size • Safety

For workers on heavy duty jobs; in hot or dusty work; exposed to chemical splash—any hazardous job—you can get what you need from WILLSON. Not only that, but every type has comfort features that help get safety equipment worn; and all have reliable WILLSON Super-Tough* lenses. For help in selecting exactly the right equipment for your needs, ask our nearest distributor for our new catalog—or write direct to WILLSON PRODUCTS, INC., 221 Washington St., Reading, Pa.

(Continued from page 156)
lon foam engine, and costs less than one-third as much. It is a compact unit that is easily operated by one inexperienced person. It delivers a water stream as well as a foam stream. The switch can be made without shutting down the unit. The unit can be furnished for storage in freezing locations, ready for instant use. No yearly recharging is necessary. It is less than 2' high, fits a 1" booster hose, and weighs only 26 lbs. with charge. Depending on the pressure and type of foam liquid used, it will deliver up to 540 gallons of foam, has a range of up to 50', and will last up to 6 minutes.

No. 136 — For further information see Page 19

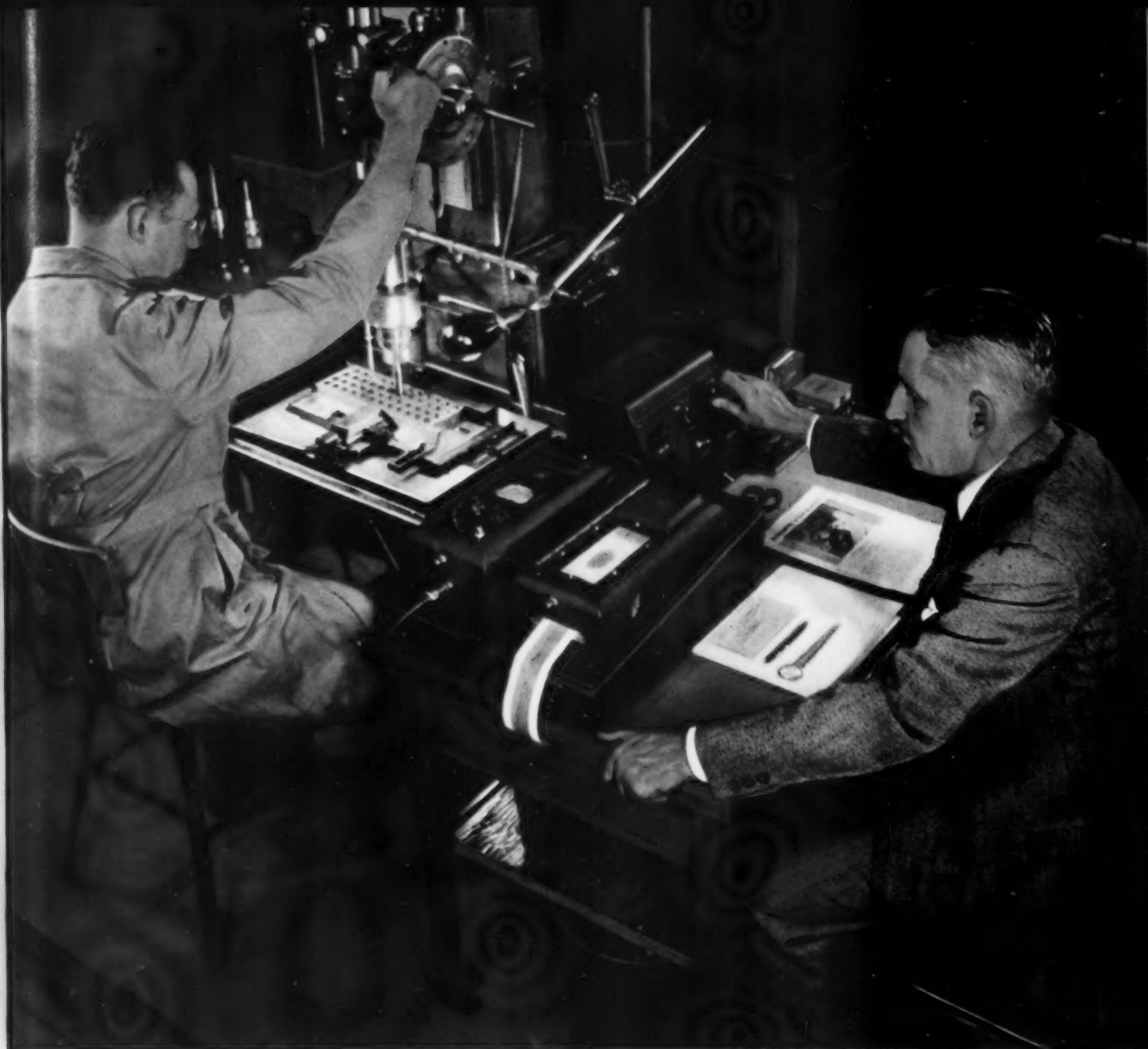
Ball Roll Quill Mounting



A big complaint from jig borer users is that frequent skilled maintenance is necessary to keep the conventional plain bearing quill mounting operating to "tenth" precision. Pratt & Whitney says it has overcome this problem with a new ball roll quill mounting. "Phantom" illustration shows its construction. Two steel liners are set in the head casting, and then precision lapped in place. The spindle quill, which is hardened, ground and draw polished to extreme accuracy and a fine micro inch finish, "roll feeds" on 240 precision balls, all preloaded, giving a total bearing pressure of 6000 lbs. between the quill and hardened liners. Yet hand operation of the quill is so sensitive the operator can easily feel a 1/8" drill feeding down in the work. More information available from Pratt & Whitney, West Hartford 1, Conn.

No. 137 — For further information see Page 19
(Please turn to page 162)

**See Purchasing's
Classified Section
Page 344**



Why Greenfield?

These men know what a tap will do *before* it does it. They are experts in tap torque testing. At "Greenfield's" research laboratory, torque tests are permanently recorded on oscillograms by the electronic torque meter. Careful study of the torque records provides the basis for continuing tap improvement.

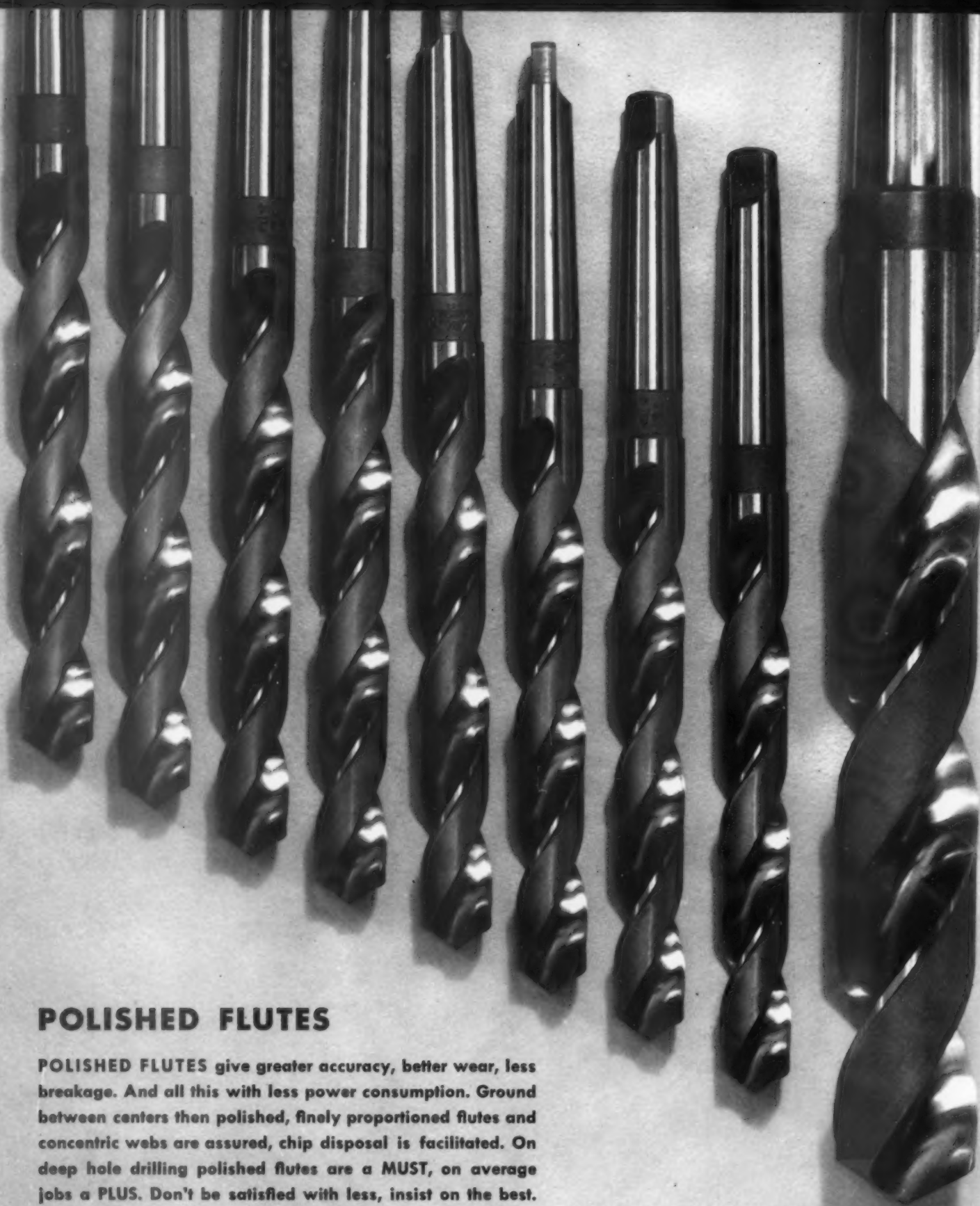
The big three in "Greenfield's" program — careful research, engineering developments, better manufacturing techniques — have made "Greenfield" leaders in the

threading tool field. When you buy "Greenfield," you know you're getting the best today. Tomorrow, "Greenfield's" research and development will make the best *better!*

GREENFIELD TAP AND DIE CORPORATION
Greenfield, Massachusetts



BUY GREENFIELD!



POLISHED FLUTES

POLISHED FLUTES give greater accuracy, better wear, less breakage. And all this with less power consumption. Ground between centers then polished, finely proportioned flutes and concentric webs are assured, chip disposal is facilitated. On deep hole drilling polished flutes are a **MUST**, on average jobs a **PLUS**. Don't be satisfied with less, insist on the best.

AMPCO TWIST DRILL DIVISION

GREENFIELD TAP AND DIE CORPORATION

Greenfield, Massachusetts

New developments in industrial lighting

General Electric reports on five years' progress toward more production, fewer accidents, less spoilage, less fatigue

Are you getting the most out of your lighting? Check the items listed below and ask yourself how much you know about these new developments in factory lighting—all of them have come to the fore in the past five years.

1. SLIMLINE FLUORESCENT

This is fluorescent lighting with long, thin tubes up to eight feet long. Chief advantages for industry are simple and very easy maintenance, high efficiency.



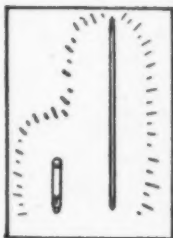
2. R-52 LAMPS

These are 500 and 750 watt lamps that have built-in reflectors. Excellent for high-bay areas, such as foundries, and other areas where it is difficult to clean lighting equipment.



3. IMPROVED MERCURY LAMPS

The 3000 watt mercury lamp produces light at lowest overall cost—an enormous amount of light from one source. General Electric's new 400-watt EH-1 lamp now gives 25% more light, important in saving energy and materials.



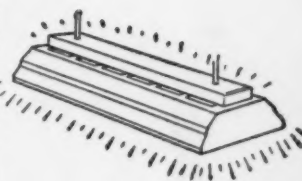
4. PLANNED MAINTENANCE

In many cases, regular cleaning, plus replacement of lamps in groups on a regular schedule, produces important savings in cost of light.



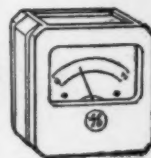
5. BETTER LIGHT DISTRIBUTION AND BETTER SHIELDING

New fluorescent fixtures, available from a number of manufacturers, direct some of the light upward, to avoid undesirable extremes of contrast between work and surroundings. And better shielding helps reduce uncomfortable glare.



6. HIGHER LIGHTING LEVELS

Not so many years ago, fifty foot-candles seemed like a high level in industry. But experience indicates this should be a *minimum* in most types of work.



7. SIMPLIFIED FLUORESCENT LINE

General Electric's line of four (4) white fluorescent lamps ends earlier confusion about which color of white fluorescent to buy. Use *Standard White* (cool or warm) where efficiency is most important; use *DeLuxe White* (cool or warm) where completely satisfactory color rendition is required.

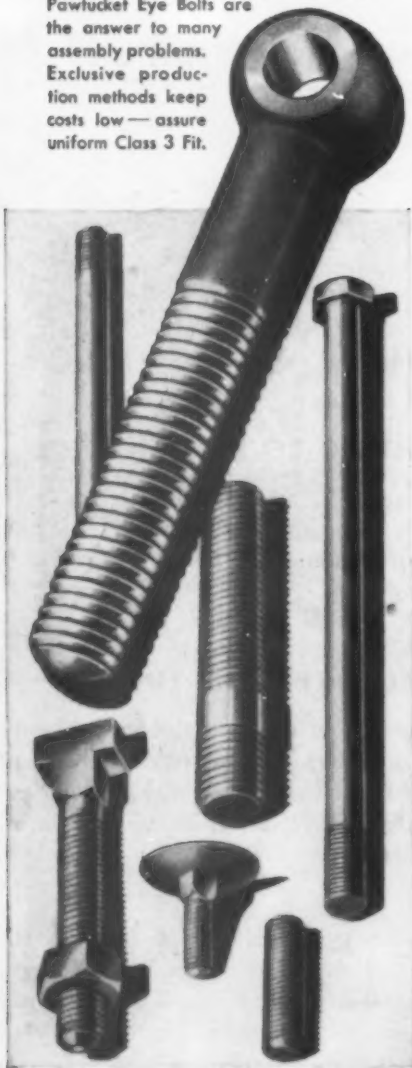
If you're planning new lighting, be sure to look into the new developments listed above. And even if you modernized your lighting as recently as five years ago, it will pay you to check into them. By bringing the lighting in your plant up to the latest standards, chances are you can boost production, cut down accidents, have less spoilage, reduce fatigue. Let us help you with your production lighting. Call your nearest G-E lamp office. Or see your G-E lamp supplier or your local electric service company. Lamp Department, General Electric Company, Nela Park, Cleveland 12, Ohio.

You can put your confidence in —

GENERAL  ELECTRIC

Looking for specialties EYE BOLTS

Accurately made in sizes $\frac{1}{4}$ " and larger, or to your specifications, Pawtucket Eye Bolts are the answer to many assembly problems. Exclusive production methods keep costs low—assure uniform Class 3 Fit.



BETTER BOLTS SINCE 1882

Use Headed and Threaded Fasteners
for Economy and Reliability



Grease Rig



A two-wheeled, highly maneuverable Lube Service Cart for dispensing lubricants to industrial bearings is a new product of Gray Company, Inc., Minneapolis 13, Minn. All grease and oil equipment on the rig is removable, allowing greasing of machines which are inaccessible to the cart. All equipment is hand operated and no air lines or electric cords are used. When stocked with grease and oil the cart is a completely self-contained unit. One model dispenses grease from a bucket type unit which holds 30 lbs. The other pumps from a 25 lb. to 40 lb. refinery filled pail. Each has a 10 ft. high pressure hose with control valve. An oil pump is included on each model.

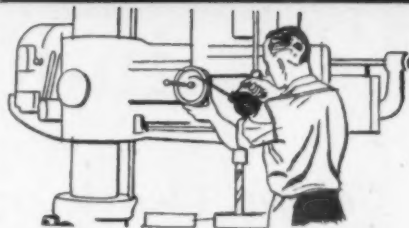
No. 138—For further information see Page 19

Containers



One answer to the current container shortage is Vulcan Tin Can Company's substitute for the widely used standard I.C.C. lug cover container. The "emergency" container, made in 1 to 5 gal. capacities, has a tin plate body with hand soldered locked seams. Covers and bottoms are of either tinplate or clear lacquered black plate. Lug covers (Please turn to page 164)

KEEP THINGS RUNNING SMOOTHLY
OIL WITH AN EAGLE OILER!



*"makes machines
last longer"*

Regular oiling, as every mechanic knows, prolongs the life of machines and prevent breakdowns due to friction and wear. That's why Eagle Oilers are so important in every industry. Be sure your Oilers are Eagles—because an Eagle is always dependable—it lasts longer, too.

Eagle Hydraulic Pump Oilers are sturdy, positive-acting—pump any oil that flows—one drop or a full stream.

Order from your Distributor



EAGLE
MANUFACTURING
COMPANY
Wellsburg, W. Va.

You'll find these products
in **SAFE HANDS!**

HANDEEZ —

a must where hands come in contact with lubricating oils . . . Lifts shop grime from pores, gently but thoroughly. Contains a sterilized vegetable emollient which acts as an absorbent. Non-irritating . . . keeps skin free of cracks where dermatitis starts. In powder form—bulks BIG at low cost.

BORSUDS —

A borated, soluble hand cleaner for heavy grime on tender skin. Contains finest medium and low titer soaps (the lower the titer the more quickly soluble the soap). Lathers richly even in fairly hard water, cannot clog drains.

VOLAX —

Extra-heavy duty hand cleaner. Removes ground-in grime, printing ink, stubborn dirt. Contains friable volcanic ash.

DISPENSING EQUIPMENT AVAILABLE

See your **DOLGE SERVICE MAN**
or write for literature.



THIS STEM WILL LAST LONGER

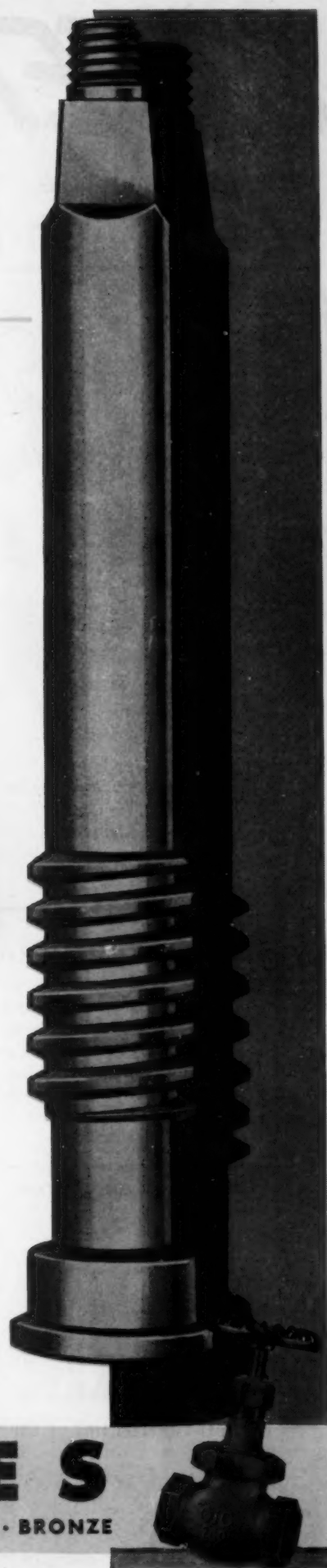
... because
it's machined
from
OIC Alloy 40



Months ago, we introduced Alloy 40 to the field; use has confirmed our laboratory tests. Now, we are ready to tell you about it.

Alloy 40 completely eliminates galling and seizing. It is harder and stronger. It is highly resistant to attack by corrosive liquids and semisolids. It lasts longer!

All OIC Bronze Valves are now equipped with Alloy 40 stems. The Ohio Injector Company, Wadsworth, Ohio.




V A L V E S

FORGED AND CAST STEEL • IRON • BRONZE

SAFETY THAT'S BEYOND PRICE!

Yours for little extra cost with

LAUGHLIN
Safety Hooks



"The Latch Locks the Load"

Laughlin Safety Hooks, costing little more than ordinary hoist hooks, pay for themselves many times over by preventing accidents. That sturdy safety latch guards against dangerous failure — mechanical or human — in a number of important ways. For example:

1. It prevents load from slipping or jarring loose in mid-air.
2. It eliminates the hazard of carelessness — the load that was supposed to be lashed but wasn't.
3. It prevents overcrowding the hook.
4. It warns of hook failure, because latch will open if hook starts to spread.

Rig Safety into YOUR Hoists

by changing over to Laughlin Safety Hooks. Made of drop-forged, heat-treated steel, they have pressed steel latches in the smaller sizes, cast bronze latches in the larger sizes, all with stainless steel springs. Available in various types for 750 lb to 15 ton safe working loads at your mine, mill or oil field supply house.

Free!

Catalog-Data Book tells you how to select the *right* wire rope and chain fitting for every job. Complete specifications — helpful tables. Use the coupon below.



SEND IN TODAY
... no cost or obligation

THE THOMAS LAUGHLIN COMPANY
43 Fore Street, Portland 6, Maine
Please send Catalog-Data Book #150 to:

Name Position

Company

Street

City Zone State

LAUGHLIN



THE MOST COMPLETE LINE OF DROP-FORGED WIRE ROPE AND CHAIN FITTINGS



(Continued from page 162)
are fitted with either tubular or flowed in gaskets and employ standard closing tools. The container, which is slightly more expensive than standard I.C.C. units, is satisfactory for heavier and semi-solidified substances, but is not recommended for thin liquids. Available in carload or trailerload lots. Vulcan is located in Bellwood, Chicago, Ill. No. 139 — For further information see Page 19

Transfer Pump



The Lincoln Engineering Company's new transfer pump, called the Speed-Flo Model 82230, transfers fluids at 22 gallons per minute. It can be used with lubricants, thinners, coolants, naphthas, non-corrosive chemicals and many other materials without spillage, mess or waste. The pump fits all 2" opening drums. A built-in, disc-type, precision flow regulator permits fingertip regulation of output volume. Of sturdy, steel construction, it weighs only 18 lbs. Bulletin #213 available. Lincoln is at 5783 Natural Bridge Ave., St. Louis 20, Mo. No. 140 — For further information see Page 19

Pivoted Fork Tines



Some tough material handling problems, such as approaching and lifting a load at angles up to 45°
(Please turn to page 168)

Constant
"STOPS AND STARTS"
knock out ordinary
gas trucks

Constant stop-start operation in industrial trucks means costly operation. Clutch, tires, engine, power transmission parts — and even the driver — are too quickly worn out. Replacement costs mount and trucks lose time on the job. There is *one* way to lick this problem—it's Fluid Drive, the famous cushioned power transmission used exclusively in the new YALE Fork Lift Gas Trucks!

Only YALE has
FLUID DRIVE to
solve Stop-and-Start
problem

And only the new YALE
can smooth out your
materials handling
with these other
exclusive features

Heavy duty hypoid gearing! 65HP all-weather engine! Shockless steering! Automotive hydraulic brakes! Cold drawn precision aligned uprights! These parts — every vital part, in fact — have been selected, tested and *proved* for their ability to give you more work for your money. Let us show you exactly *how much more!* Write for all the facts today.

Capacities up to 10,000 pounds

YALE is the registered trademark of The Yale & Towne Manufacturing Co.

THE YALE & TOWNE MFG. CO.

Department 253
Roosevelt Boulevard & Haldeman Avenue,
Philadelphia 15, Pa.

I am interested in cutting my materials handling costs.

- ☐ Please have your local representative call on me.
☐ Please send me FREE detailed literature.

Name _____

Company _____

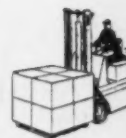
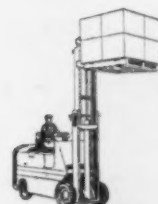
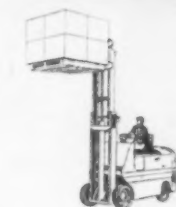
Street _____

City _____ State _____

YALE

MATERIALS HANDLING DIVISION
Philadelphia 15, Pa.

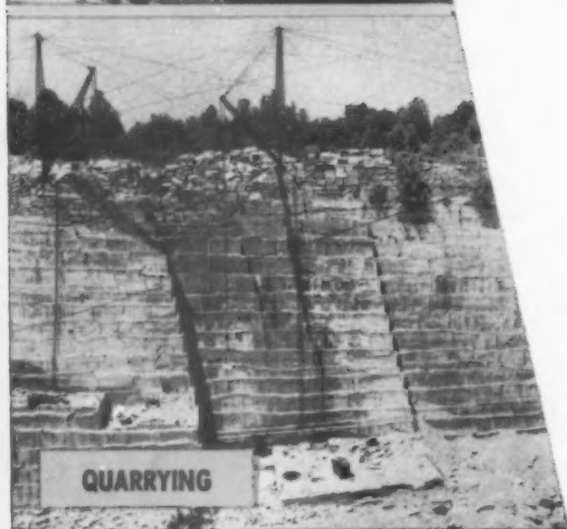
THE YALE & TOWNE MANUFACTURING COMPANY



Is your competitor



STRIPPING



QUARRYING



DREDGING



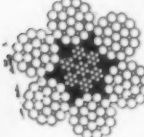


TO COMBAT SEVERE ABRASION American Tiger Brand 6x30 Type G, Excellay Flattened Strand Lang Lay. This rope has a larger metallic area than round strand ropes, greater strength, greater resistance to abrasion and high resistance to crushing. Without doubt, you will get longer service and lower wire rope costs if you use it.



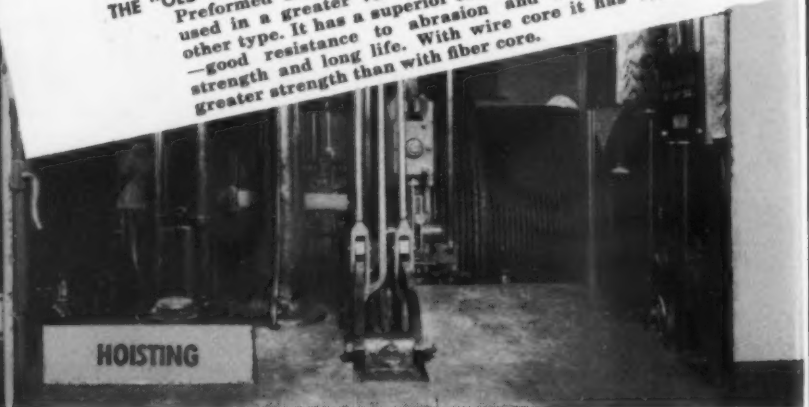

TO COMBAT FATIGUE Tiger Brand 6x37—Type S Excellay Preformed. This rope is listed as "Special Flexible Hoisting Rope" and is also known as "Crane Rope." It is the most flexible of standard constructions which permits its use with small sheaves and drums. Its reserve strength is highest of the standard constructions.




FOR RESISTING CRUSHING Tiger Brand 6x19 Seal Patent Excellay Monitor Preformed IWRC. Here's a rope that is widely used where resistance to crushing is necessary. It stands up under heavy abrasion, yet has sufficient flexibility for winding on medium sized drums.

THE "OLD WORKHORSE" Tiger Brand 6x19 Type N Excellay Preformed Standard Hoisting Rope is more widely used in a greater variety of applications than any other type. It has a superior combination of qualities—good resistance to abrasion and fatigue, high strength and long life. With wire core it has 7½% greater strength than with fiber core.



HOISTING

SMARTER than you?

You may be paying double

his wire rope costs unless you follow a few simple rules

The wrong wire rope on a job where abrasion or fatigue is severe has been known to cut service life in half . . . and careless handling or just plain abuse will result in similar short service. To get the best wire rope for your job, you should consider these four major requirements carefully—

1. Is it strong enough to take care of any load that may be applied, with a proper factor of safety?
2. Does it have the ability to withstand repeated bending without failure of the wires from fatigue?
3. Will it withstand abrasive wear?
4. Can it take crushing?

A proper choice is made by correctly estimating the relative importance of each quality and selecting a rope that has the best combination of properties for your application.

HOW THE TIGER BRAND SPECIALIST CAN HELP YOU

It is obvious that *one or even a few* types of wire rope can't meet all conditions. What's more, the average user can't be an authority on wire rope. That's why it's so important to use the engineering knowledge of a man who has made wire rope application his life work. The Tiger Brand Wire Rope Specialist can analyze your problems and recommend the best rope to fit your needs.



American Steel & Wire Company
Rockefeller Building, Dept. G-3
Cleveland 13, Ohio

Please send me your 125-page handbook,
"American Tiger Brand Wire Rope."

Name.....

Company.....

Address.....

City.....Zone...State.....

AMERICAN STEEL & WIRE COMPANY, GENERAL OFFICES: CLEVELAND, OHIO • COLUMBIA STEEL COMPANY, SAN FRANCISCO
TENNESSEE COAL, IRON & RAILROAD COMPANY, BIRMINGHAM, SOUTHERN DISTRIBUTORS • UNITED STATES STEEL EXPORT COMPANY, NEW YORK



AMERICAN TIGER BRAND WIRE ROPE

Excellay Preformed

UNITED STATES STEEL

**COLD HEADED—
ROLL THREADED**

Pheoll

Special Fasteners
and Small Parts
are Better

*Because
You
Get*



A greater variety of fasteners and small parts that can be made faster, stronger and more economically by Pheoll's cold heading and roll threading methods. Cold working of wire stock often surpasses turning, casting, stamping, drawing or molding.

LOWER MATERIAL COST . . . Cold-heading results in much less scrap than in metal cutting operations, in fact in the production of most cold-headed parts there is little or no scrap.

LOWER PRODUCTION COST . . . due to high production rate. Cold-heading . . . entirely automatic, is not affected by operator skill, strength or fatigue.

LOWER DIE COST . . . Cold-heading dies cost less, even on more intricate sections, than for any other forming operations.

INCREASED TENSILE STRENGTH . . . Improved physical properties are imparted to all metallic fasteners by cold working.

GREATER TOUGHNESS and FATIGUE RESISTANCE . . . because grain flow of material is compacted and directed to follow contour of piece.

UNIFORMLY HIGH QUALITY PARTS . . . assured because cold working requires materials free from structural defects.

Single or multiple secondary operations can be performed on cold headed parts to produce special characteristics required to fit the part for its particular application. Such operations include drilling, tapping, milling, shaving, flattening, notching, flanging, trimming, bending, off-setting, slotting, fluting, swaging, knurling, pointing, heat treating, plating and finishing—all in Pheoll's modern plant.

PHEOLL PROFIT PRODUCING FASTENERS

Machine Screws	Thread Cutting Screws
Phillips Recessed	Tapping Screws
Head Screws	Cap Screws
Sems	Threaded Rods

Pheoll



SCREWS • BOLTS • NUTS

(Continued from page 164)

from parallel, are solved with a new device for fork trucks offered by Elwell-Parker Electric Co., Cleveland, O. Each tine of the fork is adapted to swing inward from normal straight forward position. The tines can be brought almost together in the form of a V, or one can remain in normal position while the other is moved over far enough for the outer end to touch. With either adjustment it is not necessary for the truck and pallet to be in alignment before a load can be lifted or deposited. The device is furnished as a part of some Elwell-Parker models, or may be supplied as an attachment for standard model fork trucks.

No. 141 — For further information see Page 19

**Unit Renders Lift Truck
Gas Fumes Harmless**

A major hazard in gas fork lift truck operations—noxious exhaust fumes—is eliminated with a new development by the Oxy-Catalyst Mfg. Co., Inc., Wayne, Pa. Called the OCM Catalytic Exhaust, the unit renders exhaust gases non-poisonous and odorless by means of a built-in catalyst (reacting agent). It can be adapted to any type lift truck and is easily installed in place of the standard muffler, requiring approximately the same amount of space. A pyrometer installed on the truck's instrument panel indicates efficiency and safety of operation both of the exhaust and the truck engine. The exhaust operates only on unleaded gasoline, making it safe for inside factory use.

No. 142 — For further information see Page 19

Bi-Colored Lenses



American Optical Company's new bi-colored fused lenses have several important advantages over the older two-piece lenses. Instead of fitting two half-lenses, the sin-

gled, fused lenses can be fitted in a fraction of the time. Fusing eliminates all possibility of light streaks being present. Uniform thickness is assured and there are no rough edges. The lenses are beveled to fit spectacle goggles or cup-type goggles and are made in regular and 6-curve, round and FV3 shapes. They are for workers in heat treating and furnace operations, scarfing and burning operations, some open hearth and blast furnace operations, kiln processes and welding. AO is at Southbridge, Mass.

No. 143 — For further information see Page 19

150-lb. Extinguisher



Many flammable liquid or electrical fires quickly prove too much for the standard 20-pound or 30-pound portable dry chemical extinguishers. For such emergencies, Walter Kidde & Company, Inc., Belleville, N. J., has come up with a wheeled unit with 150-lb. powder capacity for both Class B and Class C fires. The two steel cylinders, one of which contains the chemical the other nitrogen under pressure, are mounted on two wheels and properly balanced to permit one-man mobility. Nozzle at end of 50-foot hose can give a "fan" or straight discharge pattern. "Fan" position discharges a dense blanket of dry chemical over a wide area, after the straight, long-range, concentrated stream knocks the fire down and subdues heat sufficiently to permit operator to move in close.

No. 144 — For further information see Page 19

Also Noted . . .

Hyster Company, 2902 N. E. Clackamas, Portland 8, Ore., offers a variation of its standard 30,000 lbs. capacity straddle truck, known as Model "MHS", especially designed for handling steel. A

(Please turn to page 170)



Let the
"MAGIC" APPEAL of
Cleanliness Improve Your Business!
Use LINEN and TOWEL SERVICE

... the *low cost* service that supplies you with fresh, clean cotton towels, uniforms, and other items ... in the *quantity, style and sizes* you want, *when* you want them!

Saves You Money—Improves Your Business ... You *never invest a penny* in expensive linens when you use Servilinen. *Your business is better* because people like to do business where *cleanliness* is apparent.

Guards Public Health ... Hygienically clean linens guard public health, give your business a reputation for immaculate *cleanliness*

that *invites* people back again.

Improves Morale ... An abundance of soft, clean cotton towels enables everyone to look better, work better, feel better on the job.

CALL the Linen & Towel Supplier in your locality—he'll show you how to improve business, save money. Get the interesting, informative booklet giving complete details about Servilinen by WRITING DIRECT TO: The Linen Supply Assn. of America, 22 W. Monroe St., Chicago 3, Illinois.



This campaign is being sponsored in the interests of the linen supply industry by

M. SNOWER & COMPANY

Division of Opelika Manufacturing Corporation, furnishers of washable service apparel and towels to the linen supply industry.

**Speed Up
Your Old
Equipment
with Roll-
Easy**



CASTERS



Rolling stock that doesn't roll easily cuts efficiency and profits in any business. Colson's 1458 different caster designs meet every need: casters for metal-working plants, textile plants, railroad terminals, hospitals, hotels and department stores. Let a Colson Engineer show you how you can modernize your rolling equipment easily and at very low cost with precision built easy-roll, easy-swivel Colson Casters.

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Position _____
Company _____
Street _____
City _____ Zone _____ State _____

THE COLSON CORPORATION
ELYRIA, OHIO

(Continued from page 168)

number of improvements extend the truck's utility in unusually severe operating conditions.

No. 145 - For further information see Page 19

M. A. Ford Mfg. Co., Inc., 732 W. River St., Davenport 11, Iowa, claims its new carbide rotary tool is the first to finish stainless steel welds quickly, economically and effectively. The flute design is said to finish parts in half the former time and to increase tool life 400% to 800%.

No. 146 - For further information see Page 19

Two new maintenance products, which use extracts of tropical plants to produce "natural" action, have been introduced by Agava Products, Inc., 34 Exchange Pl., Jersey City, N. J. "Clear-a-Drain" is a harmless but effective colloidal organic compound for cleaning drains. Agava boiler conditioner acts as a rust and corrosion preventative in addition to removing scale, impurities and oil from boilers.

No. 147 - For further information see Page 19

A midget moisture meter instantly determines the moisture content of wood, lumber, plaster and wood products. Made by Tagliabue Instruments Divn., Weston Electrical Instrument Corp., Newark 5, N. J.

No. 148 - For further information see Page 19

Hevimet, a non-cutting metal even heavier than cemented carbide and with 50% greater density than lead, is now being manufactured by Carboloy Company, Inc., Detroit 32, Mich.

No. 149 - For further information see Page 19

The Formica Co., 4614 Spring Grove Ave., Cincinnati 32, O., has brought to 80 the total number of color patterns now offered in its decorative laminated plastics. The new Formica designs are "Skylark", an ultra-modern abstract pattern, and "Fernflo", which recreates a natural pattern of foliage.

No. 150 - For further information see Page 19

Germelim is the name of a new disinfecting liquid cleaner that is said to safely clean, sanitize and deodorize floor surfaces of all types in one operation. The Davies-Young Soap Company, Dayton, O., the manufacturer, states that most dangerous floor bacteria are destroyed on contact with the soap, which rinses freely.

No. 151 - For further information see Page 19

Sun Oil Company, 1608 Walnut St., Philadelphia 3, Pa., has announced a new series of refrigeration oils for higher-operating temperature air-conditioning and refrigerating equipment. They are said

(Please turn to page 174)

Say
"CHESTER"
FOR DEPENDABLE
CHAIN
HOISTS!



...particularly when you
need "Specials" fast!

With a modern, compact, completely integrated plant—Chester Hoist is in a position to move fast on special orders. In some cases, we have been able to make shipments in one-third the time required by other hoist manufacturers.

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CHESTER HOIST DIVISION

The National Screw & Mfg Company
Lisbon, Ohio

P-2

How to get the most out of the aluminum you get

ALCOA'S "HOW TO DO IT" SERIES OF FILMS AND BOOKLETS ARE FREE THRU ALCOA DISTRIBUTORS...

Now is the time when Alcoa's 63 years of knowledge on manufacturing can help you more than ever. The Alcoa "HOW TO DO IT" library of 12 films and 7 booklets is *basic* on the subjects listed below. This information is just a part of the aluminum service our national network of Distributors can give you. *Call your Alcoa Distributor for help—on any problem.* ALUMINUM COMPANY OF AMERICA, 1966C Gulf Building, Pittsburgh 19, Pennsylvania

FILM SUBJECTS

Spinning 16 minutes	Tube & Shape Bending 13 min.
Drawing, Stretching, Stamping 22 min.	Brazing 7 min.
Blanking & Piercing . . 15 min.	Riveting 26 min.
Resistance Welding . . 12 min.	Fabricating Processes . 20 min.
Arc Welding 10 min.	Sheet Metal Practice . 20 min.
Torch Welding 17 min.	Machining 32 min.

BOOKLETS

Forming 64 pages	Machining Alcoa Aluminum & Its Alloys . 66 pp.
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Aluminum & Alloys . 168 pp.	Riveting 56 pp.
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Metal Goods Corporation



MOTOR STARTERS

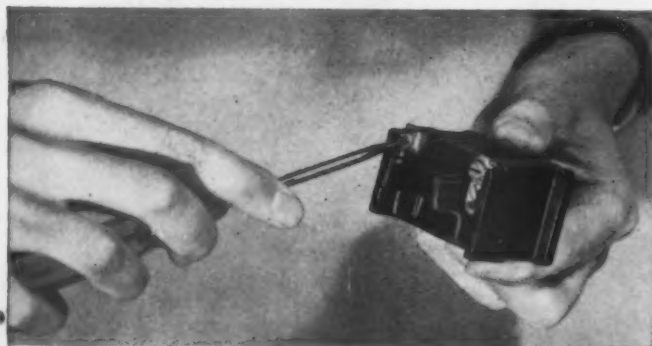
...need less

MARTIN KELLY, PLANT-



Mr. Kelly: "A big part of my job is to keep every piece of electrical equipment in the plant going—with the minimum of maintenance. That's why I want to know how a motor starter is going to perform a year, even 5 or 10 years from now. I've found that G-E starters need less upkeep than any other starter on the market today. Let me take it apart and show you why."

Martin Kelly, Plant Electrician for John R. Evans & Co., changes an overload relay on G-E combination starter quickly and easily.



Mr. Kelly: "First, the coil. It sure takes rough handling!"

1

Right you are, Mr. Kelly. We call it the "Strong-box Magnet Coil." That block of plastic keeps the windings permanently protected against dirt, moisture, and oil. And if your screwdriver slips, it can't damage the windings.



Mr. Kelly: "I've seen no sign at all that these contacts are burning or pitting."

2

That's because they have fine silver tips that outlast by far the ordinary type contact. Even where it's a "start-stop" job with dozens of operations each minute, they'll stand the gaff.

GENERAL



ELECTRIC

730-20

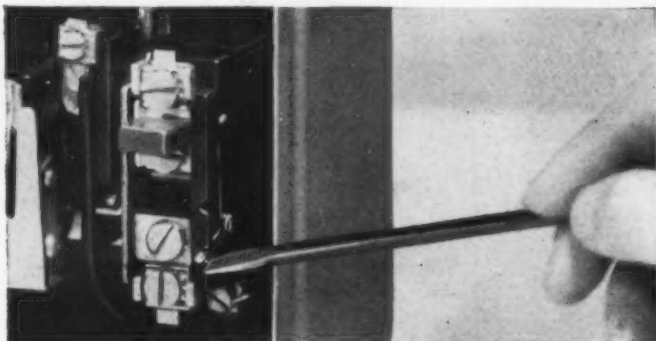
upkeep for 4 big reasons!

ELECTRICIAN, SHOWS WHY—WITH THE "SCREWDRIVER TEST"



Mr. Kelly: "There doesn't seem to be any wear on the moving parts."

3 That's right. The moving structure is rugged and basically simple. There's no metal-to-metal friction between magnet and coil; thus, little or no wear. And the "molded-in" lubricant in the coil keeps the magnet operating smoothly and quietly for life.

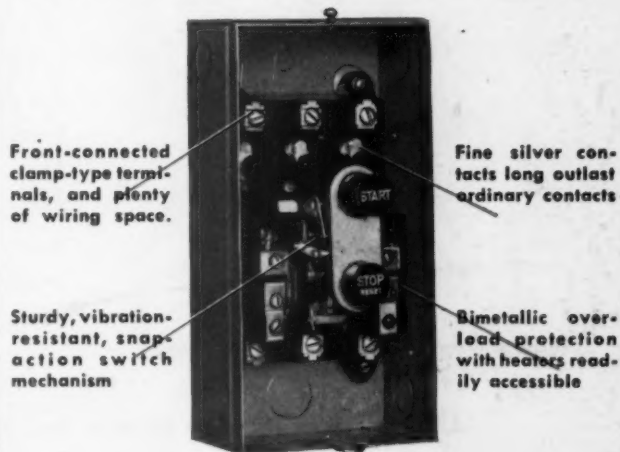


Mr. Kelly: "Overload protection means a lot; I certainly don't want any burned-out motors these days."

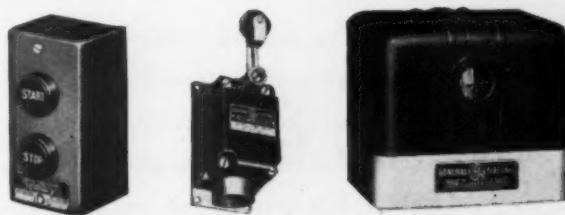
4 Those overload relays will give your motors all the protection they'll ever need. They are reliable and never need any attention. Heaters are in front and can easily be changed without disturbing any wiring.

MANUAL STARTERS, TOO . . .

For infrequent starting of 7½ hp or smaller motors, you can't beat a G-E manual starter for economy and dependable operation. . . Built to the same rugged specifications as the magnetic starter, it includes many of the same features for long life and easy upkeep.



A complete line of control accessories . . .



Push-button stations, limit switches, photo electric relays

. . . and many others can make operations more automatic, more convenient.

BUY ONE AND COMPARE! Disassemble a G-E motor starter, magnetic or manual, and inspect it. See for yourself why G-E starters last longer, cost less to install, and are easier to maintain than any starters you can buy. Your G-E representative or authorized distributor can supply many models of G-E starters in NEMA sizes 0, 1, 2, and 3 for motors up to 50 hp; anticipate your requirements and place your order early. For more information on magnetic starters, write for Bulletin GEA-5153; manual starters, Bulletin GEA-1522. Section 730-20, Apparatus Department, General Electric Company, Schenectady 5, N. Y.

America Comes To *Acushnet* For Precision-Made Rubber Parts



Supplying the
Aircraft, Automotive,
Home Appliance, Toy,
Electronic, Sport Goods,
Safety Equipment and
many other industries
manufacturing as-
sembled products.

ACUSHNET customers from all over America have found that distance is not a barrier to a dependable, specialized source. For years we have consistently demonstrated our ability to unfailingly help maintain the production schedules of large and distant plants by supplying rubber molded parts in volume, on time.

With confidence in our technical skill, and coordinated laboratory-to-production planning, distant customers know their requirements are scheduled within hours after their telephone calls.

ACUSHNET is one of the world's largest molders of rubber parts exclusively. Our extensive, specialized facilities assure uniform precision throughout every stage of production.

Acushnet
PROCESS COMPANY
New Bedford, Mass., U. S. A.

Send for Rubber Handbook
on your company letterhead



Address all communications to 770 Belleville Ave., New Bedford, Mass.

(Continued from page 170)

to keep newer, better-running compressors sludge-free and operating at peak efficiency.

No. 152 — For further information see Page 19

A new electric production mixer, the "Whip-It", will thoroughly mix a gallon of interior flat paint out of suspension in less than 5 minutes. It can also be used in a wide variety of mixing jobs with chemicals, pastes, etc. Will not splash or stir air bubbles into enamel or varnish. Made by H. C. Sweet Co., 12083 Woodbine Ave., Detroit 28, Mich.

No. 153 — For further information see Page 19

A new flame-resistant Royalite thermoplastic sheet material which will not support combustion is made by United States Rubber Co., Rockefeller Center, New York 20, N. Y. It is also tough, highly resistant to impact and light in weight.

No. 154 — For further information see Page 19

A hose which fits all makes of standard commercial vacuum cleaners stretches from a nominal length of 6' to 14½' without the slightest tension, yet recoils on release to an easily stowed length. Eliminates wrestling with stiff, heavy vacuum hose around corners, overhead, or in getting at hard-to-reach places. Product of Pullman Sales Corp., Room 835, 581 Boylston St., Boston, Mass.

No. 155 — For further information see Page 19

The life of rubber parts and surfaces hardened, cracked and inelastic with age can be prolonged with a rubber plasticizer offered by Schwartz Chemical Co., Inc., 326 W. 70th St., New York 23, N. Y. When applied to an old rubber surface, Schwartz says, it imparts the feel, grip, resilience and performance of new rubber.

No. 156 — For further information see Page 19

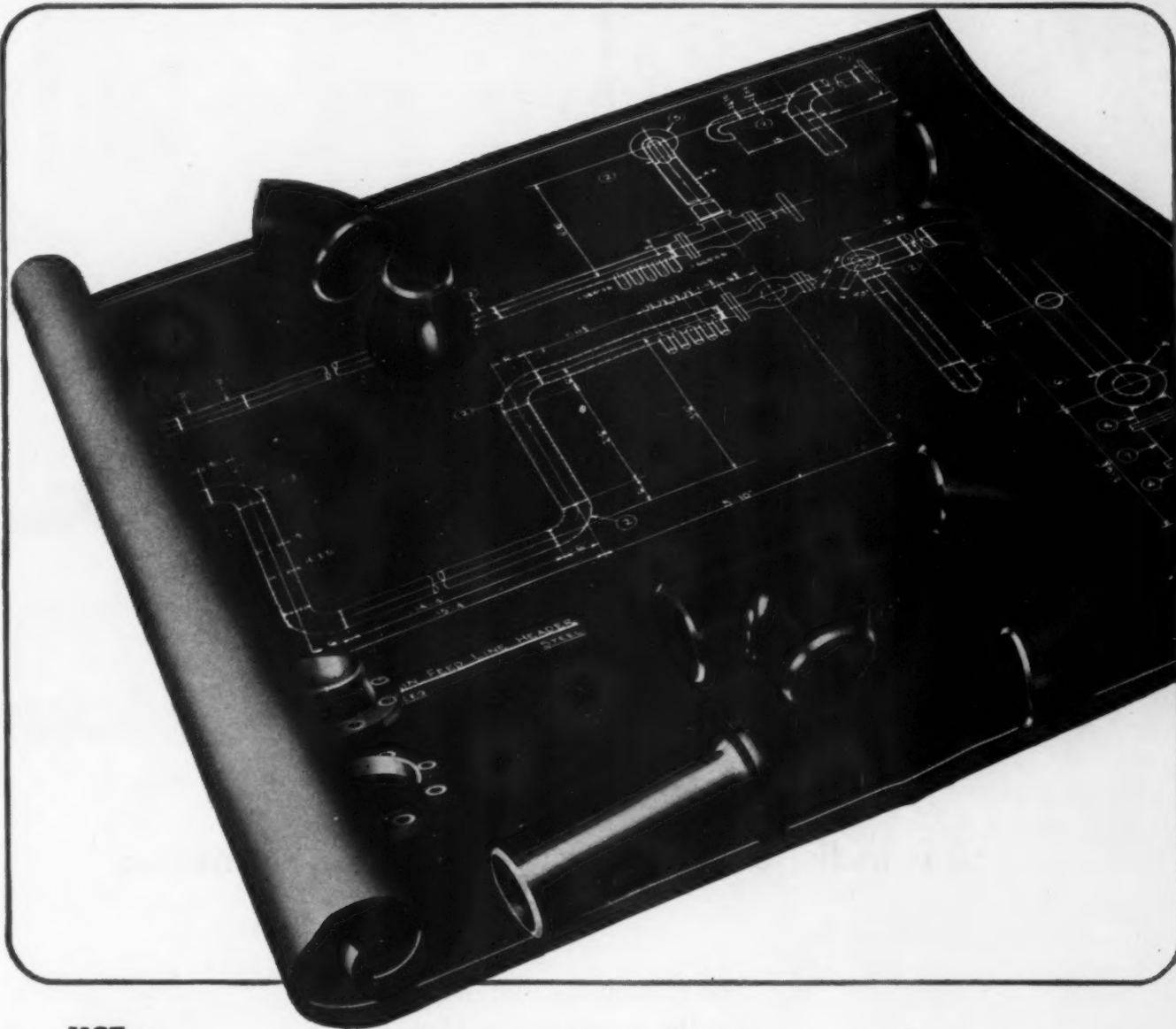
The Mall Tool Co., 7725 S. Chicago Ave., Chicago 19, Ill., has a new portable electric impact wrench which applies and removes screws, studs and nuts. Model 2EW will also drill, tap, ream and extract broken capscrews or studs and drive wood augers, hole saws and wire brushes. The 11", 7 lb. unit is said to be good for use in close quarters.

No. 157 — For further information see Page 19

Industrial Marking Equipment Co., 7 E. 48th St., New York 17, N. Y., has brought out a pail printer for printing around the circumference of 2, 3 or 5 gal. pails. The pail is placed on an expanding mandrel, and when the one-revolution clutch is tripped it is printed by means of a rubber die.

No. 158 — For further information see Page 19

TO DO A BETTER PIPING JOB . . .



USE . . .

GLOBE

**PRECISION PROCESS
SEAMLESS WELDING FITTINGS**

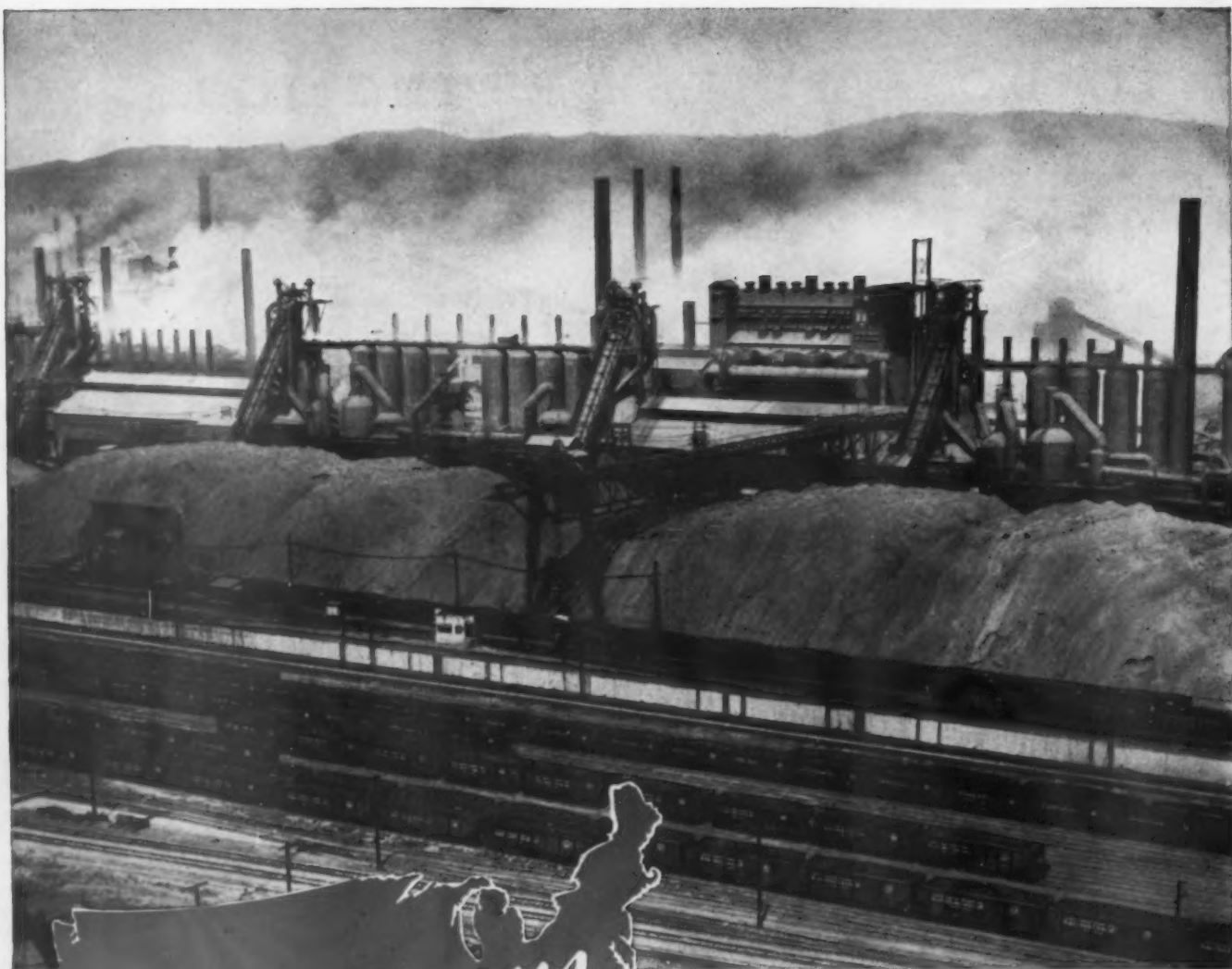
When you specify and use Globe Welding Fittings you have the product of an organization with unusually broad metallurgical experience. Globe's precision-process method of production reaches back to the manufacture of the Globe seamless tubes themselves which are the "raw material" of Globe welding fitting fabrication.

GLOBE STEEL TUBES CO., Milwaukee 4, Wisconsin
Chicago • Minneapolis • Cleveland • Detroit • New York • Philadelphia
St. Louis • Houston • Denver • San Francisco • Glendale, Cal.

Producers of Globe seamless stainless steel tubes — Gloweld welded stainless steel tubes — carbon — alloy — seamless steel tubes — Globeiron seamless high purity ingot iron tubes — Globe Welding Fittings.



Send for the Globe Welding Fittings Catalog—and look to Globe as a preferred source of supply.



is indispensable to the power of America

The bituminous coal industry
has the strength—the know-how—
to meet *any* challenge.

Only with indispensable bituminous
can the greatness of America be maintained.

For excellent bituminous coals
to meet your every need,
Ask our man!

BALTIMORE & OHIO RAILROAD

Constantly doing things—better!



PURCHASING

MARCH, 1951

OFFICE EQUIPMENT and SUPPLIES



PURCHASING MAGAZINE — A CONOVER-MAST PUBLICATION
205 EAST 42ND STREET, NEW YORK 17, N. Y.

—Modernize—

YOUR CATALOG AND BULLETIN FILES

Bring your source information up-to-date on new and improved office equipment and supplies by checking the latest trade literature listed on this page. This special office equipment section is in addition to the regular trade literature section on pages 19, 21, 22, and 24!

— When Writing to Manufacturers Direct, Please Mention **PURCHASING Magazine**.—

□ **72. FOLDING MACHINES** — junior Jet, 14 x 20", 17 x 22", five-fold folding machines styled the Baumfolders, are described in bulletin which shows the 60 styles of folds that can be made on the machines — 4 to 16 pages. Machines have five folding plates and will make 1, 2, 3, 4 or 5 folds in one operation. They fold, cut, score and perforate. Russell Ernest Baum, Inc., 615 Chestnut St., Philadelphia, Pa.

□ **73. PAPER JOGGER**—Circular describes the Magic-Jog paper jogger, which has 10" x 12" jogging table. The jogger is automatically activated when the full weight of the paper is firmly on the table. Contact point is determined by sensitivity control knob. Operation for various paper loads is easily controlled. Magic Circle Mfg. Corp., 6136 E. Admiral Place, Tulsa 15, Okla.

□ **74. WIRE RECORDER**—Printed matter illustrates and describes the Webster-Chicago wire recorder for general dictation, report transcribing, recording meetings, etc. Foot control leaves user free use of his hands, and also simplifies the transcribing job. The unit measures 11" x 11½" x 5½", weighs less than 20 pounds, is easily portable and can be used anywhere is an a-c outlet. Webster-Chicago, 5610 West Bloomingdale, Chicago 39, Ill.

□ **75. STENCIL DUPLICATOR** — Printed matter describes the Rex-Rotary duplicator, Model M2, a double drum machine which uses

paste ink. It handles all size sheets from postcard to foolscap. Counter registers the exact number of copies produced and not the revolution of the turning handle. Rex-Contex Distributing Co., 128 West 23 rd St., New York 11, N. Y.

□ **76. WORLD GLOBE**—Bulletin sheet describes the Aristocrat 25-inch world globe. It has a surface area nearly five times that of the 12-inch globe, and stands 44 inches high. Map in color contains thousands of easy-to-read place names. Globe rotates on a meridian ring which turns easily to expose any part of the world. Weber Costello Co., Dept. G-25, Chicago Heights, Ill.

READER SERVICE

All listings include names and addresses of manufacturers.

However, each one is numbered. If you want to save Multiple-letter writing, just jot down the numbers of the items you want and month of issue, and list them in a letter on your COMPANY letterhead to

Reader Service Dept.
PURCHASING Magazine
205 E. 42nd St.,
New York 17, N. Y.

NOTE: This service also applies to all the new products, equipment and supplies listed on pages 130-174

□ **77. PLANNED FORMS** — Samples of "Planned" forms, used by companies similar to yours, are available for the asking. Three basic forms serve every business requirement. These are the carbon leaved Lithoset, the carbon leaved Lithostrip which fits typewriters and all fully automatic machines, and the Lithofold single purpose forms which can be supplied fully or partially interleaved. American Lithofold Corp., St. Louis 15, Mo.

□ **78. COPYING MACHINE**—New Copying machine, the BW Copyflex can be located anywhere in the office. It's ideal for "desk-side" copying. Provides exact smudge-proof copy of anything typed, written or drawn. No special training required for operation. It provides fast, cheap method for obtaining one to 100 copies. Copies 8½" x 11" average less than two cents for all costs. The 100th copy is as sharp as the first. Printed matter available from Charles Bruning Co., Inc., Dept. P-21 100 Reade St., New York 13, N. Y.

□ **79. REFERENCE FOLDER** — Based on statement of prominent purchasing agent, the Standard Register Co., Dayton, Ohio, has prepared for convenience of purchasing departments, nine-section reference folder (20 pages) which gives complete information on its products—stock and custom printed forms, registers, feeding devices, auxiliary forms — handling equipment, service, delivery, prices, terms, warranties, etc. Companion set has been prepared for companies using tabulating machines.

Believe it or not—
this is a
Dictating
Instrument!

EDISON PRESENTS

the smallest... lightest... simplest
and most inexpensive
Dictating Instrument ever invented!

IN ONE HISTORY-MAKING stride, Edison has advanced instrument dictation years ahead of anything ever before offered! The EDISON TELEVOICE System is an *entirely* new facility for handling your written communications—new in concept and scope—new in the instruments employed—new in the direct, simple, economical way it serves you!

Imagine a system of recording from many stations to a central point. Imagine that these EDISON TELEVOICE Stations are like your present telephone—as small and dependable—and as simple and familiar, so that no instruction is necessary! For the first time, you have no discs, cylinders, belts or index-slips to change or manipulate!

Consider that start, stop and playback, as well as length and correction indications, are all accomplished by *remote control* with simple push-buttons right on the TELEVOICE Station!

Now you can understand how profoundly Edison has transformed instrument dictation—turning it into an office necessity like the telephone and typewriter.

The EDISON TELEVOICE System, moreover, achieves an efficiency hitherto unapproached. One to twenty TELEVOICE Stations connect to the EDISON TELEVOICewriter, located at the *secretary's* desk. Hence, dictation is now “delivered” to her—instantly, clearly, continuously. It cannot sit, neglected, on some dictating instrument. Messenger pick-up service is eliminated. The secretary paces her transcribing to the work *as it is dictated*, and returns “the world’s fastest signature service” without peaks or pressure.

TELEVOICE installations are made on a work-load basis to assure free-line service to all concerned. The economy is obvious. With many dictators served by *one* recording machine, costs of instrument dictation are cut by as much as 66⅓%!



Many low-cost,
easy-to-use,



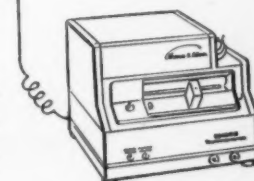
remote-control
TELEVOICE Stations



connect to one
single, central
recording instrument—



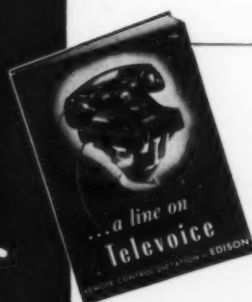
the EDISON
TELEVOICewriter



And it's an
EDISON
first!

Edison TeleVoicewriter

The Televoice System



GET THE WHOLE STORY—NOW!
Send for this new descriptive
booklet. Or, to arrange for a
demonstration, call “EDIPHONE”
in your city. In Canada: Thomas A.
Edison of Canada, Ltd., Toronto 1,
Ontario.

EDISON, 48 Lakeside Avenue, West Orange, N. J.

Okay — send me A LINE ON TELEVOICE.

NAME _____

COMPANY _____

ADDRESS _____

CITY _____

ZONE _____

STATE _____

Thomas A Edison
INCORPORATED

A Solution for Problem of Partial Receival Reports

By **D. N. Rogers**—Purchasing Agent, Stromberg Carlson Company, Rochester

PROFITING by our experience in the last war, Stromberg-Carlson Company, manufacturer of communication equipment, developed a one-writing purchase order plan that has solved our partial receival problem.

Under our old method, purchase orders were typed with 4 carbon copies. But the number of copies varied, reaching as many as 14 at times. To gain flexibility in number of copies, and to reduce the cost of producing them, we adopted the Ditto one-writing purchase order

method, using gelatin process duplicators in our purchasing and receiving departments.

When our partial receival problem became acute, as it is likely to do for many companies under present emergency conditions, as many as 175 partial shipments were received on a single order. This meant that masters had to be retyped to provide the required number of partial receival reports. This overwhelming amount of rewriting has now been completely eliminated by the installation of a Ditto direct



D. N. Rogers, Purchasing Agent, Stromberg-Carlson Company



A set of 12 copies is run from the purchase order master. In original writing of purchase order, the second gelatin master is replaced with a direct process master which can be re-used in the receiving department as often as is necessary.

process duplicator in our receiving department.

Now, in the original writing of a purchase order, the second gelatin master is replaced with a direct process master which can be re-used in the receiving department as often as is necessary. No re-copying of the original purchase order data is required. When each partial shipment is received, the quantities, date, etc. are written on a small variable master which is combined with the original master to run complete, up to date reports. The reason we combine both gelatin and direct process is that our procedure requires the use of a rubber stamp. In such cases, the gelatin process provides a better method of reproduction.

From the purchase order master, a set of 12 copies is run. In an average of 6 hours a day, an operator produces 180 sets of these cop-

181

Practical Purchase Order Form

This simple Purchase Order is being used at the Lewisburg, Tenn., Kankakee, Ill., and Gardner, Mass. plants of the Florence Stove Company, according to E. O. Nelson, Purchasing Agent, Lewisburg.

[illegible]

This Purchasing Department copy of the P. O. carries follow-up and receiving record, and invoice and transportation data record.

Actual size of form is 8½" x 7¼". Instructions are printed in upper right-hand corner. "Conditions" on reverse side are published below.

FLORENCE STOVE COMPANY

Lewisburg Division
LEWISBURG, TENNESSEE

NOTICE

MAIL ALL INVOICES IN DUPLICATE TO LEWISBURG ON DAY OF SHIPMENT. EACH PACKAGE MUST HAVE OUR ORDER NUMBER, OUR PART NUMBER AND QUANTITY ON THE OUTSIDE. THE SAME DATA MUST APPEAR ON ALL CORRESPONDENCE. IN VOICES SHIPPING NOTICES ETC. PACKING SLIPS COVERING LAST SHIPMENT ON ORDER SHOULD BE MARKED-FINAL SHIPMENT.

PURCHASE ORDER

DATE

REQ. #

DEPT.

DATE WANTED

ACCOUNT

TERMS

F. O. D.

PLEASE SHIP THE FOLLOWING MATERIAL TO LEWISBURG, TENN.

VIA

QUANTITY

DESCRIPTION

PRICE

BILL RETURNABLE CONTAINERS AS A SEPARATE ITEM

FLORENCE STOVE COMPANY

PURCHASER'S AGENT

SEE OTHER SIDE FOR TERMS AND CONDITIONS IN FILLING THIS ORDER

"Terms and Conditions to be Complied with in Filling this Order"

1. Acknowledge this order forthwith, giving shipping date.

2. Unless specified herein, do not fill this order at a price higher than last charged or quoted without first advising us, and receiving our written consent to do so.

3. Terms specified in this order are understood to be acceptable to you.

4. No charge to be made or allowed for packing, crating, bags, containers, or reels, unless otherwise specified.

5. The Purchaser shall have the right at any time to cancel in whole or in part the undelivered portion of this purchase order by written or telegraph notice to the Seller, who shall immediately, upon receipt of such notice, discontinue all work in respect to the cancelled portion of this purchase order except such as may be necessary to preserve and protect the work and materials then in process and shall use its

best efforts to cancel and terminate all then existing orders placed or entered into by the Seller which are chargeable to the cancelled portion of this purchase order. In the event of such cancellation, the Purchaser shall make payments to the Seller in full settlement of all justified claims arising out of such cancellation for the actual expenditures and costs to the Seller in connection with the incompleted portion of this order. In case of such claim, the Purchaser shall have the right to inspect any work done or any material bought in connection with the claim.

6. Any and all molds, tools, dies, jigs, or fixtures ordered hereon or delivered to you by us shall become and remain

the property of Florence Stove Company, and shall be used in the manufacture of articles for us exclusively and shall be delivered to us forthwith upon our request and without additional cost to us.

7. No modification of the conditions herein set forth shall be binding upon us unless made in writing and signed by our duly authorized officer or agent. We assume no responsibility for any goods delivered or work done under any modification or change affecting this order unless such modification or change has been duly authorized in writing.

8. This order is not valid unless signed by a duly authorized officer of the Company, or agent.



CHEMICALS...A *Great* NAME IN INDUSTRY

Great DESK EQUIPMENT

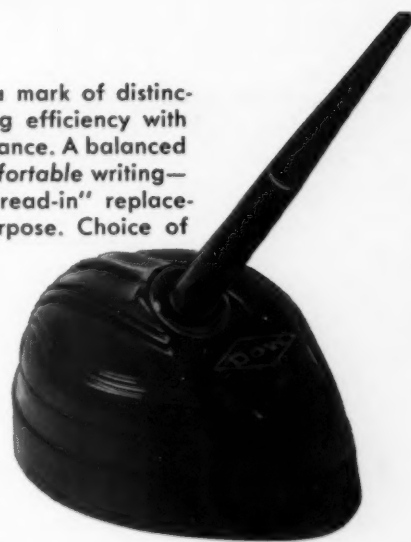
Exacting business men choose Morris desk equipment for quality, efficiency and years of service. Many famous users have their seals or emblems imprinted in Gold.



THE BERT M. MORRIS CO. has been extremely careful to design all their desk equipment for sturdy—efficient—time saving usage without sacrificing smartness. A rich appointment to any executive's desk, yet the complete setting shown—pen set, memo pad, phone rest, letter tray, ash tray and book ends, retail for little more than the cost of one higher priced,—comparable fountain pen set.

MORRIS FOUNTAIN PENS—a mark of distinction. The utmost in writing efficiency with streamlined, smart appearance. A balanced pen for long hours of comfortable writing—has 5 different quick "thread-in" replaceable points for every purpose. Choice of eight colors.

THERE IS NO SUBSTITUTE FOR QUALITY. All Morris writing sets are equipped with iridium tipped points and each point is tested at factory by actual writing.



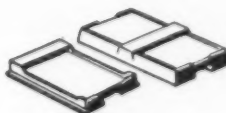
MORRIS DESK EQUIPMENT STILL LEADS THE FIELD



MORRIS FOUNTAIN PENS—an efficient and economical pen set with "thread-in" point section. A real time and money saver in any office.



BOOK ENDS—MORRIS BOOK-EZE—at last an inexpensive book end to match modern office furniture.



MORRIS MEMO PADS—available in two types. With Jewelers Bronze bar that drops as paper is used or standard box style.



MORRIS LETTER TRAY—strong two point suspension allows access from entire front and both sides. Tiers quickly added, legal or letter size.



MORRIS ASH TRAY—A real He-Man ash tray. Glass lined, perfect for desk or conference table.

BERT M. MORRIS CO.

8651 WEST THIRD STREET • LOS ANGELES 48, CALIFORNIA

Telegraph and Cable Service at Your Finger Tips

Installation of miniature facsimile machines, called the Desk Fax, in about 2,000 business offices in New York and nine other major cities has brought telegraph and cable service within arm's reach to that number of executives. In 1950 over two million telegrams, many of them dealing with important phases of the national defense program, were transmitted over these machines.



Written on regular form, the message is wrapped around cylinder of the Desk-Fax, and is electronically duplicated at the receiving end.

Installed without charge on the desk of the telegraph user, Desk-Fax provides push-button "picture" transmission of his message to and from the local telegraph office, where it is flashed to destination over Western Union's new automatic

high-speed network, without manual transmission at any point.

The Desk-Fax eliminates the time required for messenger pick-up and delivery. The executive sends and receives his own telegrams immediately at his desk. The machine, which is but 10" x 11" x 7" in size, reduces the sending of a telegram to the simple process of placing the message on the cylinder of the machine and pressing a button. Messages may be in longhand or type-written. Electrical impulses are transmitted by a stylus passing over the message as it turns on the cylinder. A receiving machine at the Western Union office creates an exact pictorial reproduction of the message. The Desk-Fax automatically becomes a receiving machine when the telegraph office signals that it wishes to transmit a message to the patron who places a receiving blank on the cylinder of the machine and receives the telegram.

The machines have been installed in the offices of companies in New York, Atlanta, Philadelphia, Cincinnati, Newark, Los Angeles, San Francisco, Dallas, Houston and Pittsburgh. Several thousand of the machines are now rolling off the assembly line, and thousands more will follow as far as allocation of material under the defense program will permit. The first thousand of the new machines will be installed at Washington.

SMITH-CORONA INTRODUCES NEW OFFICE TYPEWRITER

Practical feature of the new Series 6 office typewriter being introduced by L. C. Smith & Corona Typewriters Inc., Syracuse 1, N. Y., is a new device known as the page gage. The gage indicates exactly how near the typist is to the bottom of the page. It consists of two graduated rings attached to the typewriter platen. The operator simply adjusts the movable rings to the size paper she is using and the gage does the rest. When the typist is two and one-half inches from the bottom of the page, a red signal appears on the outer scale. To within one-half inch of the paper's end, the graduated scale shows the typist the exact writing location. The scales are graduated for paper lengths 7 to 14 inches, but the device may be adjusted for shorter or longer sizes if necessary.

Another feature is an enlarged platen which provides more grip surface, thus minimizing the chance of paper slippage. The new platen, 10 percent larger than the generally



accepted standard, requires less curvature of type faces, and makes for sharper impressions. Another innovation is a magnifying scale-scope on the carriage directly below the printing surface, which magnifies the graduations on the carriage scale, making them clearly visible.

A new electrofilm dry lubricant finish is being utilized on the super-support segment. This new finish, which is not only self-lubricating, but also extremely durable, will assure long life and ease of operation of the machine, company officials say.

POPULATION CHANGES BRING SHIFT IN MARKET AREAS



Charts illustrating the ten-year growth of business and civil population, and the shift in markets brought about by population movements, were shown at recent annual sales meeting of the Sorg Paper Company, Middletown, Ohio. The charts were presented by Vice President J. A. Aull, Jr., who reviewed the extension shifts in market areas to the West and Southwest incident to changing population centers. Sales Manager C. J. Nicol is shown in the accompanying illustration, outlining the sales territory setup for 1951. R. A. Nash, vice president in charge of sales, conducted the two-day meeting which was attended by 75 sales people and employees of the sales division.

NAMED McBEE DISTRICT MANAGER IN CHATTANOOGA

William J. O'Dell has been appointed district manager for The McBee Company in Chattanooga, Tenn. Previously he had been a salesman in Atlanta. He joined the company in 1947.

VICTOR ADDING MACHINE ANNUAL ELECTION

A. C. Buehler, president of the Victor Adding Machine Co., recently announced the election of Carl Buehler 3d as executive vice president and a director; A. C. Buehler Jr. as vice president, and A. F. Bakewell, general sales manager, as vice president in charge of sales. Mr. Bakewell has been sales manager since 1946.

(Please turn to page 186)

PAPER by SORG



Tested by TIME!

Good printing depends on good paper. That is why printers have been specifying "Paper by Sorg" with confidence for nearly a century. They know that Sorg Printing papers have met the test of time on the greatest of all proving grounds—the printing press. You'll find it a wise policy to specify Sorg papers for all your better printing.

THE SORG PAPER COMPANY • Middletown, Ohio

Manufacturers of Printing and Specialty Papers

SALES OFFICES AND REPRESENTATIVES IN

NEW YORK • BOSTON • PHILADELPHIA • CHICAGO
ST. LOUIS • LOS ANGELES

"magically effortless!"

"...that's the only way I know to describe the way Mongol Pencils write"

... says Joseph J. Burke, Store Clerk, Cambridge, Mass.



"I like pencils that write smoothly. That's why I always use Mongols"

... states Robert T. Healy, Atco, N. J. Investigator.



"Posting figures all day takes less effort with Mongol Pencils"

... claims Bookkeeper Ethel A. O'Neil, of Port Angeles, Washington.



...it's the **LIGHT TOUCH LEAD** that does it!

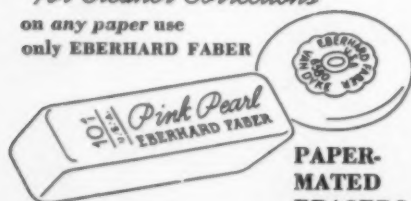


More and more offices every day specify Mongol Pencils, for their smooth, easy-writing qualities. There can be a difference in your office, too ... if you'll ask for Mongols every time.

MONGOL

by **EBERHARD FABER**

For Cleaner Corrections
on any paper use
only EBERHARD FABER



PAPER-MATED ERASERS

TRADE MARKS REG. U. S. PAT. OFF.

Parts Reveal Reports

(Continued from page 181)

The method is simple, accurate and time saving. When a requisition is received, the master is typed through Ditto direct process carbon, showing only specifications and instructions to bidders. This master is placed on a direct process duplicator to produce the necessary number of bid requests. The master is then filed.

When bids are in and the vendor has been determined, the master is pulled from the file. Vendor's name, address, order number, date and prices are added and all purchase order copies are reproduced from it.

The master is then sent to the receiving room pending arrival of materials. When the first shipment comes in, the master is taken from the file and a small variable master is written, showing quantities, date received, etc. Purchase order master and the variable master are then clamped together on the drum of the machine to run the partial receiving copies.

The original master is re-filed for repeated use until all shipments on that particular order are in. All chance of error has been eliminated because there is no rewriting. When the original is correct, all copies must be correct.

NEW FOUNTAIN PEN INKS FOR COPY MACHINE REPRODUCTION

The development of three colors of Actinic Fountain Pen Inks for Ozalid, Bruning and other copy machines, appears to be the answer to perfect reproduction by these devices.

Introduced by the Sanford Ink Company of Bellwood, Illinois, these inks were produced after extensive research with Bruning and Ozalid users. They are more opaque under exposure to actinic lights, and produce strong, sharp copies.

The new Actinic line includes the three wanted colors, brown, green and black.

One of the outstanding advantages of the new inks, according to Charles W. Lofgren, President of the Sanford Ink Co., is that they can be used in any fountain pen, and for all forms of writing with a pen. This makes unnecessary the purchase of special pens and eliminates the need for the carrying of two pens by traveling men.

Another important feature of these Sanford Actinic colored inks is that they are eradicable. This is

expected to broaden the use of the copy machines for many additional types of copy works.

The inks will be put up in four ounce bottles, and in easy-to-handle larger bottles containing one-fifth of a gallon.

1 1 1

TELE-REST HOLDS RECEIVER LEAVING HANDS FREE



Shoulder device known as the Tele-Rest, made by H. H. Renneker, San Diego 9, Calif., holds the telephone receiver comfortably to the ear and leaves both hands free. Use of Tenite plastic makes the unit light in weight yet virtually unbreakable. The device is made in four pieces—shoulder cradle, adjustment slide, receiver holder, and metal clamp band—joined firmly with adjustable screws. The clamp band fastens telephone handpiece securely into receiver holder which may be turned for use at either ear. The adjustable slide makes it possible to vary the set to meet individual needs. To ensure soft, non-skid fit on the shoulder, the underside of the cradle is cushioned with rubber.

1 1 1

IMPROVED BULLETIN BOARD

Litegreen Corkola bulletin board is announced by the Beckley-Cardy Co., 1632 S. Indiana Ave., Chicago, Ill. Instead of the ordinary tan color of cork, the board is "Litegreen." The Corkola material is a cork composition 1/8" thick bonded to 3/8" fiber board backing. It can be nailed to studding or mounted over masonry walls without fear of cracking. Litegreen bulletin material can be had in sheets 4' wide and up to 12' long, as well as made-up portable boards.

(Please turn to page 188)

Let **TEXCEL** take over!

...ALL OVER THE OFFICE!

TO FILE
IN STYLE!



Keep **TEXCEL** Cellophane Tape on hand for repairing torn file pages, for sealing closed files, for tabbing file titles clean and neat.

TO PATCH
A PAGE!



TEXCEL Cellophane Tape speeds up a dozen desk jobs. Sealing, hinging, holding, repairing and fastening tasks are made easier with **TEXCEL**. Keep it handy.

TO STOP A
POP



Nothing steps up office wrapping and mailing chores as fast as **TEXCEL** Cellophane Tape. For bigger jobs use long lengths and dispenser.

TO POST
A
POSTER!



TEXCEL takes over countless bottle-neck, time-consuming chores. Stock **TEXCEL** Cellophane Tape today!



TEXCEL CELLOPHANE TAPE

INDUSTRIAL TAPE CORPORATION
NEW BRUNSWICK, NEW JERSEY

Also makers of a complete line of pressure-sensitive tapes for industry.



METAL FURNITURE FOR STOCKING SAFETY

Line of metal chairs, tables and other office furniture of formed steel finished in either chrome or baked enamel, is announced by the Royal Metal Manufacturing Co., Chicago. Claim is made that they are so smooth and free of rough corners, edges, etc. that they will not snag even the most delicate nylon or silk threads. The chairs have adjustable backs.

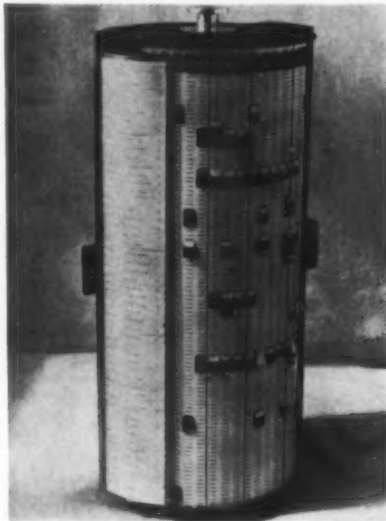
1 1 1

ROTARY VISUAL CONTROL PROMOTES EFFICIENCY

The accompanying illustration shows a rotary visual control unit which will be on exhibit at the forthcoming British Industries Fair to be held in London and Birmingham, April 30 to May 11, 1951. The system is said to give at all times a complete picture of production, traffic, sales, inventory and scheduling.

All data recorded on the cylinder progress simultaneously at predetermined intervals toward a chosen date line. The control is flexible, and units may be designed to meet changing needs. It avoids duplications of parts and materials when

modifications in design or materials are introduced during the production schedule. Rotating guides show parts, assemblies, vehicles, personnel, etc., and the data holders carry quantities and other relevant information.



The perforated cylinder has a capacity of 5,000 data holders. Colored signals are used to indicate progress. The unit is 30 inches high and 15 inches in diameter, and hence is portable.

ONE-MINUTE PICTURES FOR VISITOR AND EMPLOYEE ID BADGES

Photographic identification for visitors to defense plants and for new employees can now be completed in less than a minute using new Polaroid Personnel Identification Camera, according to the Fairchild Camera and Instrument Corp., 88-06 Van Wyck Blvd., Jamaica, N. Y. A visitor's picture is snapped by a guard as soon as he makes known the purpose of his visit, and war workers and other defense personnel can get onto the job at once with a complete "I.D." badge. With a single camera, workers can be photographed at the rate of over 1200 a day.

The camera was developed by Fairchild in collaboration with the Polaroid Corporation, and is an adaptation of the Polaroid Land Model 95 camera, using the identical process for turning out a completed picture ready for use a minute after the shutter is snapped. The standard 8-exposure role of $3\frac{1}{4} \times 4\frac{1}{4}$ Land film is used in the new camera. A field-splitting attachment and a two-position lens-

Smooth as Velvet-Velvet

LOOK FOR THE BLUE BAND

Smooth!

Smoother . . . Yes, smoother than the finest face powder—because the lead is Colloidal. Processed, an exclusive Venus process.

That's

VENUS VELVET

AMERICAN PENCIL CO. - VENUS-VELVET # 9557 No. 2

STRONGER, TOO!
The lead is *Pressure-Proofed*—another exclusive, Venus patented process that actually bonds the lead to the wood!

MORE ECONOMICAL!
Venus Velvets stay sharper, last longer. In fact, they're the finest, the smoothest office pencils you can buy.

AMERICAN PENCIL COMPANY
Hoboken, New Jersey
—makers of the world famous Venus Drawing Pencils

GET 30-DAY VELVET-SMOOTH TEST KIT and Compare!
Just attach this to company letterhead with your name.

AS SEEN IN **TIME Magazine**

mounting permit the recording of 32 pictures on the roll, four on each print. The field-splitter records two pictures of the same subject, side by side on the lower half of the print, and, by shifting the camera two more pictures are made on the upper half of the print. Individual images can be recorded in any of several sizes. No dark room is necessary. Timing of the development is automatic.

BOOKLET ON BUSINESS RECORD RETENTION AND PROTECTION

"How and How Long Should Business Records be Kept?" is title of book which presents practical ideas for the adoption of a planned record retention and destruction program, available from the Herring-Hall-Marvin Safe Company, Hamilton, Ohio.



H.H.M. "A" label record safe with burglary resistive money chest anchored inside.

Record safes are built to resist fire for 1, 2 and 4 hours, the company states, pointing out that the measurement of ordinary fire hazards for any location is at best a minimum estimate. Such things as oil fed fires, broken water mains, explosions, and uncontrollable conflagrations are beyond the scope of any known 'minimum estimate'. In the face of such extra-ordinary risks the only real security lies in using the best protection available, viz., an Underwriters' Laboratories' "A" Label (4-hour) record safe.

It is emphasized that knowing the difference between fire and burglary protection equipment is important. Fire-resisting insulation of record safes stops fire, but not burglars, and vice versa, the solid steel walls of money chests stops burglars, but not fire. The booklet previously mentioned, also gives information of adequate protection.

(Please turn to page 190)

Are Your Record-keeping Costs TOO HIGH

It's easy to pour profits down the drain if record-keeping costs are higher than they should be! Many concerns use 8, 9, 10 or more copies of business forms for various departments. With ordinary forms it takes TWO GIRLS and TWO MACHINES to accomplish what ONE GIRL can do easier, quicker, better — at less cost — with American LITHOSTRIP continuous forms!

THE OLD WAY...and the NEW!

The old, laborious way requires 9 steps to handle one set of record-keeping forms...collating, interleaving carbon, jogging sheets, inserting, aligning, turning roller, typing, removing forms and delevaing carbon. With American LITHOSTRIP continuous forms, as shown at right, it's 1-2-3...type, tear off, zip out the carbons!

If you use Invoices, Purchase and Shipping Orders, Voucher Checks, Credit Memoranda, Teletype or Tabulating Forms, Sales and Manufacturing Orders . . . SEND FOR A FREE COPY of our latest folder that tells how to cut forms handling costs 33% or more!



AMERICAN LITHOFOLD CORP.
500 Bittner Street • St. Louis 15, Missouri

Gentlemen: Send me a FREE copy of the brochure that reveals how to get better results—in less time and at lower cost—through up-to-date business methods.

COMPANY NAME.....
ADDRESS.....
CITY.....ZONE.....STATE.....
SIGNATURE.....

Write Today!

some people only
see money



That's our Treasurer for you . . . and does he make it work! Since we've gotten this wonderful CRESTLINE Office Furniture, he's done nothing but prove how many ways it's a good investment. It's all steel you know and will last a lifetime. He's smart and so will you be if you check first on CRESTLINE.

Crest LINE

SECURITY STEEL EQUIPMENT CORP.
AVENEL, NEW JERSEY



FOLDER SHOWS COMPLETE LINE OF TABULATING MACHINES

"Figure-Fact Atomic Age Accounting at Machine Speed. . . with Machine Accuracy" is the title of a new folder issued by the Management Controls Division of Remington Rand, Inc.

Both small and large businesses will find detailed information in this folder on securing figure-facts on payroll, cost, production, sales reports, inventory, or invoices produced automatically, faster, and at startlingly low costs with Remington Rand punched-card accounting machines.

The new folder shows the varied and complete line of Remington Rand Tabulating Machines, highlighting the major functions of each machine in accordance with three major accounting functions: Recording—Sorting and Arranging—and Reporting.

Besides picturing and describing each piece of Remington Rand equipment, the folder contains a unique chart showing the tremendous versatility of each machine in relation to the usual record keeping operations.

"Figure-Fact Atomic Age Accounting" will be sent on request by writing Remington Rand Inc., 315 Fourth Avenue, New York 10, N. Y.

1 1 1

PORTABLE OVERHEAD PROJECTOR FOR VISUAL PRESENTATIONS



Practical and portable overhead projector, known as the Screen Scriber, made by Bardwell & McAlister, Inc., Burbank, Calif., permits the speaker to face his audience and present a clear, concise picture of any type of visual material he wishes to present. Light beam from the projector is cast backstage creating a clear, brilliant image of the

photographic transparency or drawing projected. The screen size of the image at 15 feet is 8' x 10' and can be readily seen by an audience of 2500. Unit can be quickly focused for private office and other uses. Screen Scriber weighs less than seven pounds, and is completely portable. Screen brilliance is provided by the precision optical system and a 200 watt projection lamp, well ventilated for cool operation.

1 1 1

ALL-METAL POSTING TRAY



New type of all metal posting tray named the Norfield, is being introduced by Intasco Corp., 3021 W. Carroll Ave., Chicago 12, Ill. It is designed especially to aid users of mechanized bookkeeping systems by making it easier and faster for posting operators to locate, remove and replace ledger cards with a minimum of time and energy.

Finger pressure opens the locked tray to form a posting "V" front with back of tray at correct sloping position. Cards are prevented from creeping, slipping and crowding by the use of five spacers at 1½" intervals, with metal legs that fit into metal racks on either side below the card bottom. Perfect card alignment is maintained by the two side rails which are adjustable to accommodate cards of differing widths. Handles on the front and back slopes make it easy to remove the tray for storage or to another location.

The trays are available in three sizes of card widths: 6 to 8—8¼ to 10½ and 11¼ to 15 inches. Each tray has an overall length of 15" and accommodates 1000 32# cards. They are made of heavy gauge aluminum with gray crackle baked enamel finish. Handles and fittings are chrome plated.

(Please turn to page 192)

write that order **Fast—Complete—Correct** with **UARCO E-Z-Out Forms**



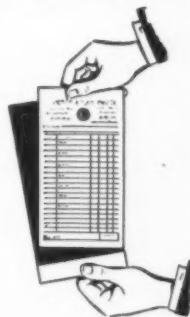
...and this new **FORMS HOLDER!**

● With Uarco E-Z-Out Forms, your salesmen write only *once*—yet make all four records that complete an order: (1) house order, (2) customer receipt, (3) salesman's copy, and (4) office record.

The job is *that* quick! Your men don't fuss with carbons—they're pre-inserted; they don't make additional records—one writing makes them all. With *each* copy colored, numbered, or otherwise identified!

And now this light E-Z-Out Forms Holder makes order writing an even easier task. Note illustration. It's pocket size; holds forms for all day; has a metal writing plate; filing compartment... a complete order unit your men use standing up.

A gentle tug—the forms and carbons are *apart*! Uarco makes E-Z-Out Forms for any record combination you need.



Efficient? Certainly—but then, Uarco makes all paperwork that way. And can for *your* organization. These E-Z-Out Forms are a good example. Mail the coupon for free samples. Examine them; you'll see!

UARCO Incorporated
Factories: Deep River, Connecticut; Cleveland, Ohio; Chicago, Illinois; Oakland, California.
Sales Representatives In All Principal Cities



Business Forms

UARCO Incorporated
Room 1619, 141 W. Jackson Blvd.
Chicago 4, Illinois

Please send samples of Uarco E-Z-Out Order Forms

Name.....Firm.....

City.....State.....

COLUMBIA ACQUIRES CANADA CARBON & RIBBON

The Columbia Ribbon and Carbon Manufacturing Co., Glen Cove, New York, recently acquired the outstanding shares of its associated Canadian firm, the Canada Carbon & Ribbon Co. Ltd., Toronto, Ont. Relations between the two companies will now be more closely coordinated than ever before. I. Lee Miller is general manager of the Canadian Company. He plans to expand its manufacturing and sales activities along the same lines established when the two companies first became associated thirty-one years ago.

ROYAL TYPEWRITER ANNOUNCES NEW APPOINTMENTS

Des Moines, Ia. V. E. Ross has been named district manager for the Royal Typewriter Company, with headquarters at 513 Fifth Avenue.

Chicago. Lee B. Sterling, formerly Royal's portable district representative at Des Moines, has been promoted to portable district representative of the territory headquartered at Chicago.

Boston. Howard M. Rowley has been assigned to the post of portable district representative for the New England territory.

Omaha. New portable district representative is Robert H. Hult, whose territory includes the greater parts of Nebraska and Iowa.

NEW KEYDRIVE COMPUTING MACHINE



The accompanying illustration shows Plus rapid adding machine, new in the field of keydrive computing machines, announced by Plus Computing Machines, Inc., 37 Murray St., New York, N. Y. The unit gives direct and immediate registration in the answer dials of the selected keys depressed, and there is no need for paper tally roll. Special models are available for additions in terms of weights, or hours and minutes.

MAKING OF CHROME PLATED FURNITURE NOW TABOO

Take good care of your chrome-plated furniture, because there won't be any more "for the duration", warns President Hobart A. Green of the Royal Metal Manufacturing Co., Chicago. Mr. Green's warning is based on Government "stop" orders on nickel and copper, both of which are needed for chrome plating. He pointed out that no more chrome-plated furniture can be made after March 1st. Modern enamel finishes will then be used. These are durable and becoming more popular.

ROYAL METAL ACQUIRES NEW FACTORY IN LOS ANGELES

The purchase of a modern new factory in Los Angeles is announced by Royal Metal Manufacturing Co., Chicago. The new plant comprises 40,000 square feet of space for the manufacture of metal furniture for professional and commercial use. It is located at 5950 Avalon Boulevard. The company will continue to operate its West Coast subsidiary, Hudson Beauty Furniture Co., Los Angeles, but will close its former



Actual Time Checks Prove:

DUPLISTICKER[®] Addressing

Averages 27% FASTER

than Addressing Envelopes

DUPLISTICKERS speed-up addressing, reduce costs, increase efficiency. Typists address 4 or more copies in one operation on letter-size sheets of 33 gummed, perforated labels. Paper is specially made for maximum number of clear copies. Ideal for mimeo and ditto duplicating. Clean, quick-part perforations, uniform stick-fast gumming. Completely trouble-free in every respect. Absolutely foolproof.

SPEED-UP YOUR ADDRESSING WITH EUREKA DUPLISTICKERS

Use "Duplistickers" for addressing all duplicate mailings, direct mail advertising, bulky envelopes, samples, premiums, etc. Postage indicia can be printed on labels for bulk mailings. "Duplistickers" serve dual purpose as address and seal on self-mailers and may be used on return cards. Package of 25 sheets (825 labels) 60¢ at leading stationery stores. White, blue, pink, green, canary, goldenrod, for color-coding.

• Write for **FREE Sample Package**

Eureka Specialty Printing Co.
333 Electric Street
Scranton 9, Pa.

DUPLISTICKERS[®] are made only by EUREKA





stands up under pressure

An Omega lead takes a lot of pressure without breaking... thin, lead holds a needle point, makes clean, sharp figures with lightest pressure. 24 brilliant colors, ends colored for quick selection. Ask for sample on your business letterhead.

The Omega is a Tryrex Pencil — shaped to fit your hand — will not roll.

RICHARD BEST PENCIL CO.
Dept. P Springfield, N. J.

OMEGA

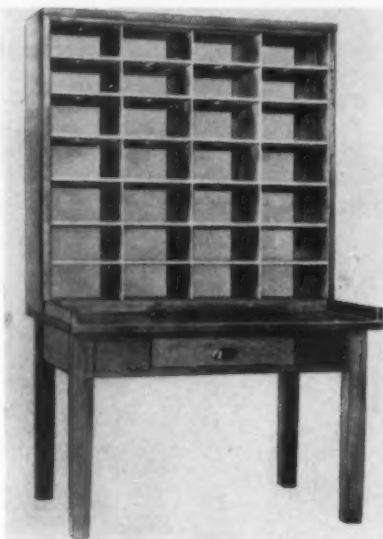
COLORED PENCILS

Makers of
ROYAL SCOT and FUTURA Pencils

Royal Metal of California plant in Los Angeles. During 1950 the company purchased the De Luxe Metal Furniture Co., Warren, Pa. (steel shelving) and completed a new building housing office, warehouse and manufacturing space in Galt, Ontario.

MAIL SORTING TABLES ANNOUNCED BY CORBIN

Illustration shows mail sorting table made in a wide variety of sizes with pigeon holes for letters or packages, made by Corbin Cabinet Lock-



Tables are shipped knocked-down, with all parts needed for re-assembly.

Wood Products Division, The American Hardware Corp., New Britain, Conn. The tables are made of selected hardwoods, sanded smooth and lacquered. Joints are dovetailed and glued.

CUMMINS BUSINESS MACHINES CORPORATION CHANGES NAME

Paul Jones, president of Cummins Business Machines Corporation, announces change of that company's name to Cummins-Chicago Corporation. Both internal growth and external expansion indicated the desirability of a corporate title more in keeping with the company's activities in the fields of perforating machines and electric portable tools. The company was founded in 1887. In 1942 it became a part of the American Security Group of Marion, Ind., and introduced fully automatic perforators, new line of check signing and endorsing machines, and new types of perforators.

In December 1945, Cummins entered the electric portable tool field,
(Please turn to page 194)



Home Sweet Home

if fuel and power companies kept **NO RECORDS**

Home Sweet Home would be pretty sour without fuel for heat and power for light and electrical equipment. But this would be the picture if nobody in the fuel and power companies kept records, for records provide the "track" on which all business and industry run.

In your business, you will find Boorum & Pease record forms and devices will simplify and speed your record keeping. They embody over a hundred years of experience in manufacturing forms and equipment.

B&P Visible Record Equipment, for example, offers you the utmost in speed, accuracy and all-round efficiency for keeping all individual records where a single card or sheet is used for each name or item. Ask your stationer for full details.

FOR EVERY RECORD — A WAY TO KEEP IT

Standard



product

BROOKLYN 1, N. Y.

THIN PAPERS

Reduce
MAILING
TYPING
FILING
Costs.

Use
ESLEECK
THIN PAPERS

Air Mail Bond
Clearcopy Onion Skin
Fidelity Onion Skin
Laid Thin Papers
Prestige Onion Skin
Superior Manifold
Thin-Opaque

Recommended for
Thin Letterheads, Copies,
Records, Forms,
Advertising.

Ideal for Air Mail, Branch
Office and Foreign
correspondence.

SEND FOR SAMPLES

ESLEECK
Manufacturing Company
Turners Falls, Mass.

(Continued from page 193)

producing three models of a quarter-inch electric drill. Today the company makes a comprehensive line of electric saws, drills, sanders, polishers and planers. In October 1951, the Fred W. Wappatt Company, Mayville, N. J. was added as a new division, producing heavy duty electric tools.

The general offices and main plant will continue in the present location at 4740 Ravenswood Avenue, Chicago, Ill.

♦ ♦ ♦

DUPLICATOR REPRODUCED FOUR-COLOR MAPS

A new hand operated map reproduction device capable of making 200 copies of four color maps in sizes up to 22 x 39 inches, has been developed by the Engineer Research and Development Laboratories, Ft. Belvoir. The duplicator uses alcohol as the dampening medium instead of water, operates under temperatures from plus 25 deg. to plus 130 deg. F. Typing, writing, or drawing is reproduced from a master sheet backed up by a special carbon paper.

Design makes maximum use of non-strategic materials, produces a final weight of 468 pounds for machine, accessory equipment, supplies and carrying chests, which makes the duplicator transportable by air. The machine can be used commercially in preparing large charts and forms.

Details available on request to Technical News Letter, Room 2-c-765, Pentagon, Washington, D. C.

♦ ♦ ♦

PENDAFLEX INTRODUCES FOLDERS AND TICKLERTABS

Expeditors, collection men and departments on "project" jobs will find of interest the new Pendaflex "Ticklertabs" which are being introduced by the Oxford Filing Supply Co., Inc., Clinton Road, Garden City, N. Y. Printed Jan.-Dec. on one side and 1-31 on the other, the Ticklertabs are readily attached to the Pendaflex hanging folder, in addition to the "Name" tab thereon. They enable the user to keep track of due dates and at the same time refer to filed material by name or subject.

Another accessory being introduced is the "Interior" folder, for use within a Pendaflex hanging folder, where two or more groups of papers are to be kept in the hanging unit, or where it is desirable to print a form on the face of the folder. These are of high quality manila in

regular letter size width, but 1/2" lower in height. They may be tabbed to order as desired.

Samples of these new accessories are available upon request.

♦ ♦ ♦

ERASERS FOR GRAY AUDIOGRAPH RECORDS

The Gray Manufacturing Co., Hartford, Conn., makes announcement of new VE-2 model VoicEraser, through the use of which Gray Audiograph records can be resurfaced and re-used up to fifty times. The Audiograph system of dictation embosses plastic records instead of etching them. The surface is grooved by a diamond embossing stylus, and when the record



is processed in the VoicEraser, heat floats the plastic back into the grooves and restores the surface in approximately three seconds. The machine washes as it erases, eliminating the possibility of surface dirt being ground into the rejuvenated records. Discs are fed into the machine by hand and carried through brushes under a detergent and warm water solution before they go into the erasing process. The machine is 16" x 19" x 13 1/8" high, weighs 52 pounds; power requirements are 5.2 amp., 115 v., 575 watts.

♦ ♦ ♦

HANDBOOK ON FILING COST AND EFFICIENCY

Creating the contents of an average 5-drawer file costs over \$4,500 and operating this file one year costs approximately \$202. Successful business recognizes that filing is the key to efficient administrative control and willingly pays this price to "file and find" its written records—the "memory" and "nerves" of a modern organization.

For the first time, criteria to

determine cost and performance standards that enable management to measure its filing procedures have been established. These are included in an extensive research study which has been recently published as a service to management by Remington Rand Inc.

Entitled "A Yardstick of Filing Cost and Efficiency", this handbook presents costs broken down in detail and clearly substantiated by charts and tables relating to the creation and operation of files. Performance statistics from operating files are summarized, characteristics of equipment reviewed, and simple criteria developed to assist management in appraising the cost and performance of their own files.

The handbook has a complete bibliography and draws pertinent material from authoritative sources in the field. Included is a simple, self-evaluating questionnaire by which management can accurately measure its own filing efficiency against recognized standards and interpret its findings into concrete action for the improvement of its filing procedures. An ingenious chart permits management to determine easily its cost of maintaining and operating a 4-drawer file and to compare this cost to the national average. This work of original research fills a much felt need and should contribute towards establishing standards in the field of office procedures.

Among the authorities and sources consulted in preparing the study were: National Records Management Council, Research Institute of America, National Office Management Association, Office Executives Association of New York, and others.

The booklet, "A Yardstick for Filing Cost and Efficiency", with an accompanying self evaluating questionnaire, can be obtained by writing Mr. F. J. Hastings, Remington Rand Inc., 315 Fourth Avenue, New York 10, New York.

SMALL DEVICE SIMPLIFIES PROFESSIONAL LETTERING

Small device, 7" x 7", known as the Varigraph, and made by the Varigraph Co., Inc., Madison, Wis., is claimed to make it possible to produce professional lettering in a fraction of the usual time. The device slides smoothly along a rule or any straight edge tacked to a drawing board, a lettering pen point at

(Please turn to page 196)

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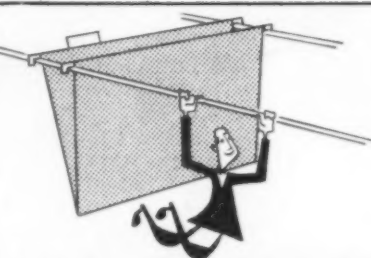


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OXFORD FILING SUPPLY CO., INC.
GARDEN CITY, NEW YORK

(Continued from page 195)

the upper left being operated by a moving stylus at the lower right along letters engraved in an insertable templet. Control knobs govern height and width of letters or numerals printed, and settings from .150



to .750 of an inch are possible. Hun-
dreds of variations of any alphabet
can be produced from one full-size
templet. The templets are available
in more than 60 popular type faces.
Housing and control knobs are of
Tenite plastic—cellulose acetate
butyrate.

1 1 1

**S. C. INDUSTRIAL ELECTRICAL SHOW
TO BE HELD IN LOS ANGELES**

Southern California's Fifth Annual In-
dustrial Electrical Show will be held in
the Shrine Convention Hall, Los Angeles,
March 15, 16 and 17, 1951. The show
is sponsored by the Electrical Main-
tenance Engineers Association of South-
ern California. The show usually draws
more than 10,000 engineers, purchasing
agents and others concerned with indus-
trial machines and materials. George
Larsen, Larsen-Hogue Electric Co., 816
West Fifth Street, Los Angeles 17,
Calif., is show director.

1 1 1

**WAKEFIELD ANNOUNCES
LUMINOUS-ACOUSTICAL CEILING**

Following several years of collabora-
tion with a lighting committee of the
Massachusetts Institute of Technology,
created to evaluate lighting trends, The
F. W. Wakefield Brass Co., Vermilion,
Ohio, manufacturers of lighting equip-
ment, recently made announcement of
the Wakefield Luminous-Acoustical Ceil-
ing, featured by a blending of architectu-
ral considerations with lighting, acousti-
cal, construction and distribution factors
involved in modern artificial lighting.
The new system is described as a lumin-
ous ceiling lighting system with diffusing
means and sound deadening.

The Wakefield ceiling consists of fluo-
rescent lamps suspended from the struc-
tural members above. About 12 inches
below the lamps are translucent corrug-
ated plastic sheets. Suspended below

these sheets at 36 inches intervals are perforated acoustical baffles, wedge shaped in cross section and filled with sound absorbing material.

The ceiling offers light intensities ranging from 50 footcandles to substantially higher levels. The plastic sheets when installed in a test room furnished an apparent transmission of 87%. The character of the plastic, screens out the outlines of the light source above, furnishing completely diffused (glareless) light quality, shadows being at a minimum. Under most conditions the light source (fluorescent tubes) are installed on a white painted ceiling without reflectors, though if special conditions so require reflectors can be installed.

The plastic sheets are easily removed for cleaning and re-lamping. In a six month test more dirt was found adhering to the bottom of the sheets than to the top face, since there is little air movement above.

A test of one year has shown (1) original intensity of light 40 to 42 foot candles; (2) after one year without cleaning, 32 footcandles; (3) after cleaning and re-lamping at the end of one year, 40 footcandles.



Installation of luminous ceiling in office of the C. F. Denzer Company, Sandusky, Ohio.

The acoustical baffles are an adaptation by Wakefield of a development by Bell Telephone Laboratories, Inc., under license to Wakefield. In a hard surface room with linoleum floors and wooden furniture, tests show a sound absorption rate of five seconds without the luminous ceiling and acoustical baffles. The same room and conditions, low frequency was absorbed in .58 seconds, high frequency in .78 seconds, and average sound in .65 seconds. Studies indicate that the vertical distribution of sound absorption is more effective than ceiling treatment and covers a wider range of sound wave lengths. The ceiling may be installed with or without acoustical baffles.

One of the important features of the ceiling is that it can cut building costs while providing an excellent source of light. No finished materials need be used above the diffuser which is the ceiling. Another saving is made possible by the fact that it is not necessary to provide special pipe and duct, as pipe and duct may be run anywhere above the plastic diffuser.

Full details about the luminous-acoustical ceiling will be furnished by the F. W. Wakefield Company on request.

(Please turn to page 199)

AN A. B. C. WAY TO CONSERVE MANPOWER

Standard Register Paperwork Simplification

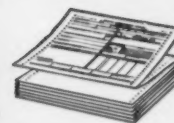


Better Records Faster at Lower Cost.

A Connecticut manufacturer reduced clerical hours for one department by \$13,000 annually. Work proceeds to production much faster. This and other experiences in *Paperwork Simplification** suggest how you can apply the same basic "scientific method" for positive improvement of any wasteful written record system in your business:

- A. Develop the best procedure.** Techniques and tools introduced by Standard Register simplify analysis—highlight ways to *eliminate, combine, change* steps for effective system operation.
- B. Simplify the writing method.** Form Flow Electric Registers, in this case, make key-record preparation an easy, fast, continuous operation.*
- C. Design the most efficient form.** Specific fact-finding led to construction of five-part combination "Factory Ticket," which eliminated costly, needless, clerical labor.*

*PS., our magazine, details such cases of simplifying *procedure, writing method and form design*—a system's A, B, C's. It's a free information service. Write The Standard Register Company, 403 Campbell St., Dayton 1, Ohio.



KANT-SLIP
continuous forms

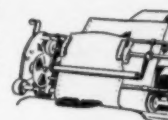


Feeding-aligning device:
THE REGISTRATOR
PLATEN

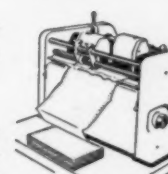


AUTOMATIC LINE
FINDER

Advances form into new writing position in one motion



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Registers 2 different forms for 1 continuous typing operation



BURSTER-IMPRINTERS
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Better records ... by hand



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EAGLE-A PAPERS



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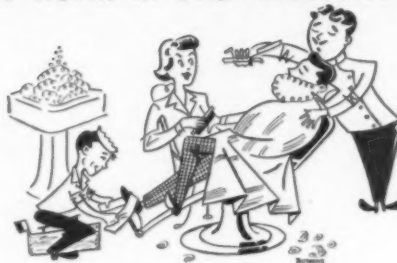
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technical uses.



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930 ENSEMBLE (PINK & GRAY RUBBER) A combination eraser that does most everything. Handy, bias-beveled shape. Soft, pink pencil rubber joined to soft, gray ink eraser. For ink, pencil and crayon erasing.



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HOLDERS and LEADS
PENHOLDERS and ERASERS



KOH-I-NOOR PENCIL COMPANY, INC. BLOOMSBURY, NEW JERSEY

The RIGHT pencil for the RIGHT job

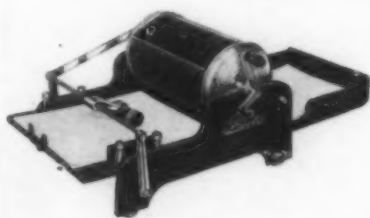
CLERICAL POSTURE CHAIR



Clerical posture chair christened "Miss Efficiency", catalog No. 950, has been put on the market by Maso Steel Products, 81 W. Van Buren St., Chicago. Legs and base are $1\frac{1}{4}$ " steel tubing. Paratex padding has vinyl coated upholstery with fabric back, welded—colors, gray green or brown. Metal structure comes in smooth baked enamel office gray, green or brown. The seat measures 15" x 13", with 2" cushion; the backrest 13" x 7" with 1" cushion. The base has wheel spread of 22". Seat may be adjusted from 17½" to 21" in height, and backrest has a 3" up and down adjustment, and an in and out adjustment of 4½".

1 1 1

INTRODUCE HOLLAND-MADE STENCIL DUPLICATOR



The Mid-Continent Sales Co., 111 W. Jackson Boulevard, Chicago, announces that it has been appointed exclusive distributor for a stencil duplicator called the Presto, Model X, manufactured in Holland by Hadewe Duplicatorfabrieken.

Features of the new machine include closed drum that is easily removable for color printing; inside semi-automatic inking brush with individual operating handle on the exterior, automatic feed with stabilizer bar, collapsible tray that slides under the machine when not in use. The machine uses the standard four-hole legal size stencil. It takes paper from post cards to legal size, and has a full eight-inch printable width.



Webster's Spirit Duplicating materials are a carefully matched team, designed to turn out clear, clean copies with speed and economy. Used together, they simplify duplicating processes, and consistently give results of the finest quality.

Materials for every duplicating need are found in Webster's complete line.

MultiKopy Shurclean Spirosets

... for results of finest quality. Master Paper and Spirit Hectograph Carbon in convenient set form. Purple and Black

MultiKopy Spirosets ... for long runs. Master units in Purple, Blue, Green, Red.

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MultiKopy Spirograph Carbon Papers ... separate sheets of flat spirit hectograph carbon in a variety of finishes and colors.

MultiKopy Master Paper ... for use with MultiKopy Spirograph Carbon papers on Spirit Duplicating machines.

MultiKopy Duplicating Fluid ... for finest results in any Spirit Duplicating machine.

Carbon Paper Ribbons ... for "master" copies to be used on Spirit Process Duplicators.

Star Skin Cleaner ... for quick removal of stain and dirt from hands. Contains no acid.

O. K. Liquid Cleaner ... for removing ink stains of all types.

Next time you need long lasting Spirit Duplicating supplies of dependable quality, order Webster's. Consult your nearest dealer or write to F. S. Webster Company.

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Pay day calls for cash on the dotted line

When you see money covered by armed guards, chances are it's cash to meet a payroll. Payroll operations you *don't* see are covered by Moore's DOTTED LINE.

On DOTTED LINE business forms an employee punches in his time. Hours he works, earnings and deductions are calculated on the Employee's Earnings Record and Payroll Register. Other forms cover government reports—social security, income withholding—insurance, union dues, etc. The actual payroll is met by check (*here* with armored-car check-cashing service) or by a continuous cash payroll envelope method.

In other businesses, too, Moore helps simplify routine and reduce human error. Moore's DOTTED LINE is *more* than a perforation—it's a *force* that runs through an organization making it efficient, protecting its profit.

Let a representative show how this can be done in *your* business. Or write headquarters—Niagara Falls, N. Y.; Denton, Tex.; or Emeryville, Calif.

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Offices in over 200 cities. Regional factories and distribution points in Canada also * * * THE RIGHT BUSINESS FORM FOR EVERY FORM OF BUSINESS.

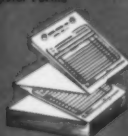
Sales Books for Every Business Operation



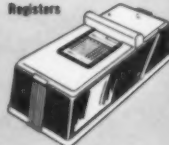
Continuous Interleaved Typewriter Forms



Continuous Register Forms



Registers



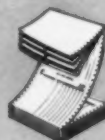
Formed Lining Machine Forms



Speedsets for Fast Carbon Extraction



Marginal Punched Business Machine Forms



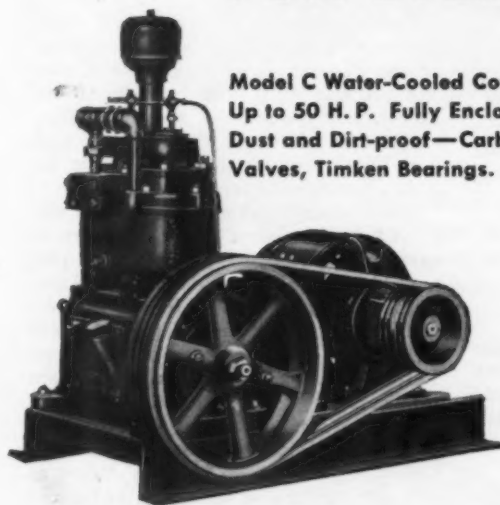


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Street.....

City.....Zone....State.....

AMONG THE Associations



Central and W. New York Conference to Be Held at Syracuse March 30 & 31

The annual Central & Western New York Purchasing Agents Conference, scheduled for the Hotel Onondaga, Syracuse, N. Y., March 30 and 31, will feature a full program tuned to the multiplying problems of a mobilized economy.

The conference will open on the morning of March 30 with plant visitations, starting from the hotel. A District 8 Council meeting, to be held in conjunction with the conference, will also take at that time.

At the opening luncheon, J. M. Austin, president of the Syracuse and Central New York Purchasing Agents Association will welcome the visitors. The principal speaker, George A. Renard, executive-secretary of the National Association of Purchasing Agents will be introduced by the general conference chairman, J. E. Edmonds, Lipe-Rollway Corporation.

The first business session, devoted to the theme "Government, Business and the P.A.", will feature a group of speakers, each a prominent representative in his respective field. The Government speaker will come from the administrative ranks in Washington. An industrial executive will speak on what top management expects of a purchasing agent under present conditions. A prominent purchasing agent will discuss problems being faced within the purchasing department, methods of controlling critical material use and inventory in accordance with restrictive orders, and general procurement problems. The group will answer questions from the floor, and Mr. Renard will be asked to sit in on the panel. Chairman of this session will be Horace W. Hooker Jr., Hooker Electrochemical Co.

The banquet will be held that evening, with a social hour preceding. The guest speaker had not been announced at this writing.

The general session beginning Saturday morning, March 31, will have as its theme "How Can the P.A. Meet the Challenge?" A Kemp Stevens, Air-cooled Motors Inc., will be chairman. First speaker will be J. B. Tomasma, sales manager of Todd Protectograph Corp. His subject will be "Sales and Industrial Purchasing Meet the Emergency". Colonel H. H. Haas, deputy chief of the Rochester Ordnance Office is expected to speak on "The Purchasing Agent and the Contracting Agencies". A prominent purchasing man is expected to talk on "Selling in Purchasing"—an ex-

position on the magnified problem and selling substitutions, new materials, processes, and restrictions to engineering production and manufacturing.

The closing will be held Saturday, noon. H. F. Jones, president of N.A.P.A. will be the principal speaker with the "President's Message". J. H. Gaston, vice-president for District 8, will also speak on "The N.A.P.A. Meets the Challenge". J. A. Cooney, International Salt Company, Inc. will be the chairman.

PURCHASING EDITOR SPEAKS AT NEW ENGLAND MEETING

A regular meeting of the New England Purchasing Agents Association was held on Monday, February 12, at the Hotel Vendome, Boston. Guest speaker was A. N. Weckler, Washington Editor of PURCHASING Magazine. Mr. Weckler's subject was "Control Actions Affecting Purchasing".

Members of the association visited the plant of the Rubber Division, Achushnet Process Company, New Bedford, Mass., on the afternoon of January 30.

CONNECTICUT ASSOCIATION INSTALLS NEW OFFICERS

New officers were installed at the January meeting of the Purchasing Agents Association of Connecticut, held in the Hotel Garde, New Haven. Installing officer was Fred G. Space, Seymour Manufacturing Co.

Guest speaker was W. J. Connelly, manager of the consumers' relations department of Union Carbide and Carbon Corporation. His subject was "The Proper Perspective on Plastics".

NORTH CENTRAL OHIO ASSN. MADE MEMBER OF NAPA

The recently organized Purchasing Agents Association of North Central Ohio, representing Mansfield, Shelby, Bucyrus, Marion, Galion, Ashland, Plymouth, Willard, Mt. Gilead and Loudonville, has been officially accepted as an affiliate of the National Association of Purchasing Agents. February 27th, the association held an Affiliation Night

meeting at the Mansfield Leland Hotel, Mansfield, Ohio, which in addition to the regular membership was attended by the national directors of the various local associations in the National Association Sixth District, and a large delegation from the Akron Association. President A. L. Davison of the North Central Ohio Association states that the sponsoring Akron group contributed a great deal of help in the organizing of the new association.

Mr. Davison is purchasing agent for the Mansfield Tire & Rubber Co., Mansfield, Ohio. Other officers are W. C. Upson, Ohio Brass Co., Mansfield, vice president; C. V. Schroeder, Dominion Electric Corp., Mansfield, secretary-treasurer; Directors, Charles Cates, Union Malleable Manufacturing Co., Ashland, and E. L. Smith, Westinghouse Electric Mfg. Co., Mansfield.

KOREAN MINISTER GUEST AT PHILADELPHIA ASSN. MEETING

Colonel Ben C. Limb, Foreign Minister of the Republic of Korea and Chief of the Korean Mission to the United Nations, was the principal speaker at the February 8 meeting of the Purchasing Agents Association of Philadelphia. Colonel Limb's subject was "The Battle for Asia's Natural Resources".

Guest speaker at the forum session was J. Neil Adam, retired regional sales manager of the Hoover Company, and past president of the Sales Managers' Association of Philadelphia. Mr. Adam spoke on "Problems of Sales Managers under N.P.A. and E.S.A. Controls, and How Purchasing Men Can Assist". William B. Joachim, Jr., chairman of the forum committee, acted as forum leader.

The Banking, Insurance and General Office Buyers' Group held its forum at 5.30 p.m., under the leadership of George E. Rose, committee chairman. The group discussed paper.

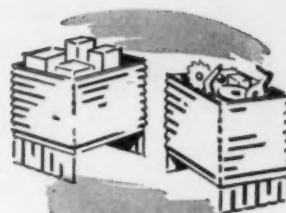
HAROLD MACINTOSH SPEAKER AT M.P.A.C. MEETING

A regular meeting of the Metropolitan Purchasers Assistants Club was held on Tuesday evening, February 13, at the Midston House, New York City. Principal speaker was Harold W. Macintosh, treasurer and purchasing agent of L. O. Koven & Bro., Jersey City, N. J. Mr. Macintosh, a former vice-president of the National Association of Purchasing Agents for District 8, had as his subject "Purchasing Department Experience".



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America's Finest Industrial Truck Battery!



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Battery trucks' floor-hugging stability permits high stacking of heavy loads with complete safety.

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Always Use Gould-National Automobile and Truck Batteries
**Formerly Gould Storage Battery Corporation*

BALTIMORE ASSN. HOLDS 31st ANNUAL LADIES NIGHT

The thirty-first annual Ladies' Night Meeting of the Purchasing Agents Association of Baltimore was held on Saturday, February 24, at the Lord Baltimore Hotel.

The party was started many years ago for the sole purpose of interesting the lady of each member's family in the association's undertakings. The idea caught on "like a snowball rolling down a hill", and party has become more and more popular through the years, until now it is the highlight of the year's activities. Attendance this year had to be limited to 800. After dinner a floor show was presented, followed by dancing.

ALUMINUM FEATURED TOPIC AT BUFFALO ASSOCIATION MEETING

The January meeting of the Purchasing Agents Association of Buffalo, held at the Hotel Statler, featured an educational presentation on "Aluminum from the Ground Up". The program included a display of several hundred of the almost innumerable items manufactured from aluminum and magnesium and the showing of an N.A.P.A. approved film on aluminum.

Among those present were Wm. H. Hunton, district sales manager of the Aluminum Company of America, Buffalo; Hugo Wilder, manager of the company's marketing division; and S. H. Bennett, works manager, Alcoa, Magnesium Division, Buffalo.

After a short talk by Mr. Wilder, the three men answered numerous questions from the floor. The presentation was arranged by commodity committee chairman Joseph W. Schwalbach, with the cooperation of Jack Rutherford, purchasing agent for Alcoa's Magnesium Division.

Among the new members of the association are Gerald Mann, Niagara Platers Inc., North Tonawanda, N. Y., and Robert F. Jones, Kencroft Malleable Co., Buffalo.

KAISER STEEL EXECUTIVE SPEAKS TO LOS ANGELES ASSN.

More than 225 members attended the February meeting of the Purchasing Agents Association of Los Angeles, which featured a talk by C. F. Borden, vice-president of Kaiser Steel Corporation. Mr. Borden discussed "Today's Steel Situation". Preceding the meeting, a sound color film entitled "Glass for Science" was shown.

A panel discussion on expediting drew good attendance at the February luncheon meeting. Cliff Walker, purchasing agent for Pacific Coast Borax Company, was moderator. Other members of the panel were Harry DeVasher, Percy Keith and Rulon Nagley.

Hugh M. Tiner, president of Pepperdine College, was a guest speaker at the association's January meeting. His subject was "United Nations in Today's World".

BRITISH COLUMBIA ASSN. HEARS TALK BY DEAN SWANSON

Reverend Dean Cecil Swanson was the guest speaker at the January dinner meeting of the Purchasing Agents Association of British Columbia. Dean Swanson called for a return to the fundamentals of strength of character, loyalty and the will to build for the future and not live in the past. Give the world a better way to live, he declared, and communism will die.

The January educational meeting took the form of a panel discussion on inventory control systems. Len Cunningham, Eric Harrison and Andy Urquhart were the speakers. Thirty-eight members attended and participated in a lively discussion that followed the talks.

New members of the association include Professor D. K. Bell, department of commerce, University of British Columbia; William G. Gourley, The Granby Consolidated Mining, Smelting & Power Co. Ltd.; Andrew B. E. Strang, Management & Services Ltd.; A. B. Grady, Alliance Ware Ltd.; L. Yeo, Kraft Foods, Ltd.

Vancouver Island Activities

J. Rutledge, personnel manager for the T. Eaton Company, Vancouver, addressed the January meeting. He discussed the place of the department store in the community. Other guests included Fred Morris, purchasing agent for the company in Vancouver, and Cliff Rutledge of the Victoria store.

Lively Folder Sparks Toledo Association's Membership Drive

WHY should I JOIN THE TOLEDO PURCHASING AGENTS ASSN?

HERE ARE A FEW REASONS - AND THEY'RE ALL TRUE

EVERY MONTH YOU MEET WITH LEADING PURCHASING AGENTS OF THE CITY TO DISCUSS PROBLEMS OF THE PROFESSION

Dear Fellow Member:

The other day someone said to me, "WHY SHOULD I JOIN THE TOLEDO PURCHASING AGENTS ASSN?"

Do you know - I couldn't give him a good answer at once. I had to stop and think what the real reasons were. I know that there are many of us who would need more than a moment's notice to get up a sales talk.

So - I am enclosing a little folder I hope will help us in securing new members. Please mail it - or give it to a good prospect. I'll be happy to welcome him.

Kindest regards

Matt King

YOUR wife or sweetheart WILL BE ABLE TO PARTICIPATE IN SOME OF OUR activities

A big GOLF PARTY Every year

WE hear AUTHORITATIVE SPEAKERS AND GO ON plant visitations

Toledo Purchasing Agents Association meeting notices have always been noted for their lively and inviting illustrations. That talent has now been put to further use in an aggressive membership campaign. Above, center, is a letter sent out to every member. Two of the outstanding pages from a folder enclosed with the letter are shown left and right. Matt King asks each member to mail or give the attractive folder to a prospective member. A top-notch "sales talk", indeed.



**YOUR
UNION DRAWN
DISTRIBUTOR
is an expert at**

***Solving—
Short-Supply—
Problems***

● If anyone can solve your steel bar and shafting supply problem, the Union Drawn Distributor is your man. He has a real knack for locating hard-to-find sizes and grades—may even have just what you need right in his warehouse. Call him and find out. If he doesn't have it on hand, he may be able to locate it for you fast—or supply you with other sizes and grades that will serve in a pinch.



CALL YOUR
UNION DRAWN
DISTRIBUTOR
Today!
HE'S READY—
TO HELP YOU

Republic **UNION** 
COLD DRAWN STEELS

**Mallflex gets more
work done with more
power in your hand...
less weight to carry**



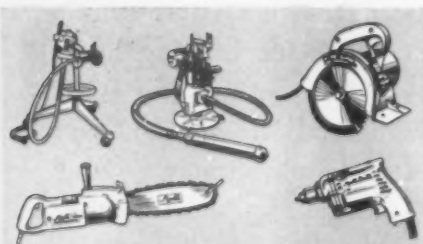
**and we'll prove it
in your plant under
your own conditions**

This Mallflex Flexible Shaft Grinder gives your operator the power of a 3/4 hp. portable tool in his hands, but, with motor weight suspended or on the floor. Many versatile attachments available to cut costs—increase output. Motor capacities up to 3 hp.

38 Factory Service Branches in U. S. and Canada with complete parts stocks serve thousands of dealers and millions of users.

**NEW AIR-CUSHIONED
GRINDING WHEEL GIVES
FINER-FINISH FASTER**

Fits all flexible shaft tools, bench grinders and drills. Should be in every tool crib. \$15—with drum, 5 abrasive bands, hand pump.



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- ☐ Please send me your free booklet "FLEXIBLE SHAFT GRINDERS"
☐ I would like a free demonstration in my own plant.

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Company _____ Dept. _____
Address _____
City _____ State _____
Kind of Tool _____

Mall **POWER TOOLS**
Put POWER into MANPOWER
Manufacturers of over 1000 Tools for a Million Jobs

Oregon Association Plans Product Show



Lyle Peterson, Purchasing Agent for Woodbury & Co., chairman of the Oregon Products Show, showing special trophies for exhibitors to models Becky Anthony and Harriette O'Halloran, voted by the Oregon Association as "The Girls We'd Like Most to Take to the Products Show".

A two-day industrial exposition, to be held in conjunction with the 15th annual Pacific Northwest Purchasing Conference, has been scheduled for April 20-21 in Portland, by the Purchasing Agents Association of Oregon.

Purchasing agents from Oregon, Washington and British Columbia will see the non-profit, free-admission show when they gather for the annual affair in the Multnomah Hotel. The conference is expected to attract over 500 visitors.

Chairman in charge of the Northwest Products Show is Lyle Peterson, Woodbury & Co., who reports that booth

rentals to date indicate marked interest on the part of companies in the area. Not only concerns eager to acquaint purchasing men with new products and methods, but relatively smaller firms seeking to show their facilities for sub-contracting and for specialized items not generally known to industry, are seeking space in the exhibit.

Two trophies are being offered to show exhibitors. One is for the most informative booth, another for the most attractive. The show program will feature demonstrations, animated exhibits, movies, entertainment novelties and merchandise prizes to visitors.

WASHINGTON ASSOCIATION HAS FULL ACTIVITIES PROGRAM

Among recent events on a full program of winter activities being followed by the Purchasing Agents Association of Washington were the following:

A noon luncheon and plant visit was held at the Seattle Packing Company on January 24. Visitors were guests of the company for lunch at the Transport Grill.

The annual mid-winter party was held on Saturday evening, February 3, at The Rainier Club. Dancing and bingo, with numerous prizes, were featured.

The annual meeting at Tacoma was held on February 8. Following luncheon at the Top of the Ocean, a plant visit was

held at the Tacoma Smelter. Bowling at the Broadway Center followed. The dinner meeting was held at the Winthrop Hotel. Feature attraction was a musical program by the Barber Shop Quartet. A film entitled "Atomic Attack" was shown through the courtesy of Union Oil Company.

1 1 1

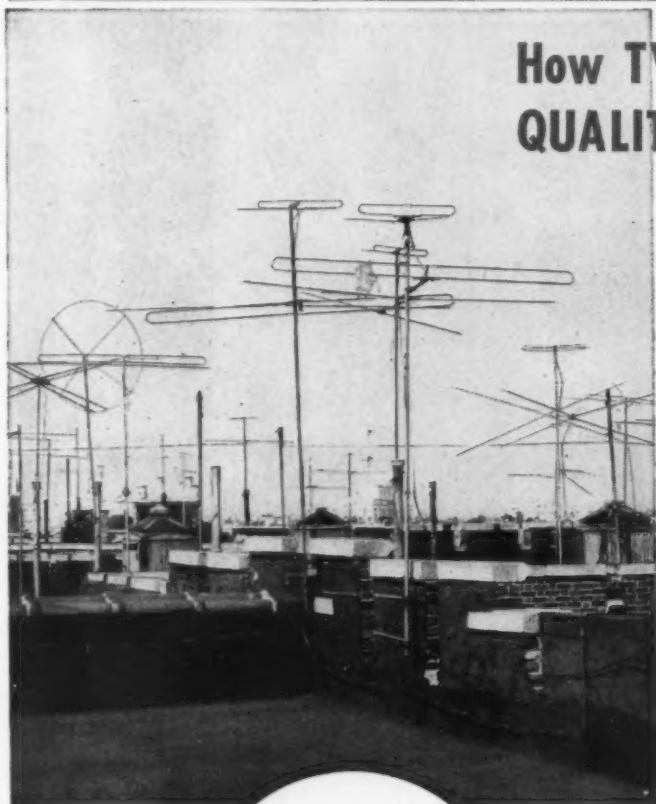
BUSINESS INDICES DESCRIBED AT SYRACUSE ASSN. MEETING

Erwin H. Such, editor of Steel, was guest speaker at the January meeting of the Purchasing Agents Association of (Please turn to page 208)



LAMINATES News

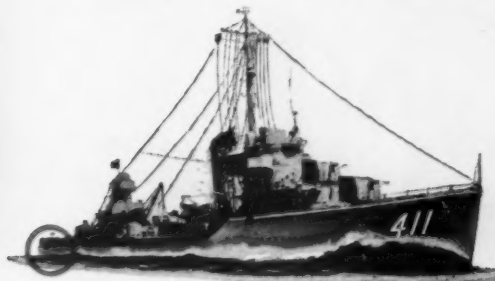
Applications for General Electric plastics laminates that can be of importance to your business.



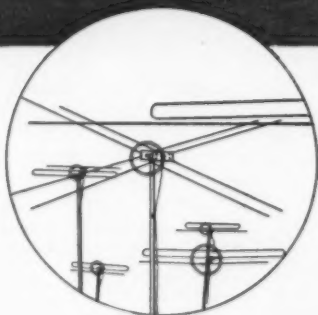
How TV benefits from the EXTRA QUALITY of G-E PLASTICS LAMINATES

Television antennas perform more efficiently when insulators are fabricated from General Electric plastics laminated sheets. G-E fine-weave, fabric-base material has excellent punching and machining properties. Its low moisture absorption makes it particularly valuable for antenna insulation.

General Electric is one of the world's largest producers and users of electrical equipment. G.E.'s years of research and experience in this field are your assurance of *extra* quality at *no* extra cost.



Bearing Down . . . rudder bearings and thrust plates made of G-E plastics laminates offer superior resistance to impact loads in marine applications. They have also replaced other materials in heavy-duty steel rolling mills, giving greater bearing life, reduced friction, power savings.



COMPLETE LINE OF LAMINATES

General Electric produces a complete line of plastics laminates—including sheets, tubes and rods—with cloth, paper, or special bases, or binders for a variety of applications.

**G-E Plastics
Speed
Defense Production**

NEW! Send ten cents for new G-E Laminates Comparator—a quick, easy reference to different grades, characteristics, and uses of laminated materials. Write Chemical Department, General Electric Co., Pittsfield, Massachusetts.

DEPENDABILITY THROUGH EXPERIENCE

Sheets . . . Tubes . . . Rods . . . Molded-Laminates . . . Insulating Materials

You can put your confidence in

GENERAL  ELECTRIC



**PROFIT BY THE
PRODUCTION
ADVANTAGES
AND INCREASED
PHYSICAL PROPERTIES
OF FURNACE TREATED
COLD FINISHED STEEL**

**ANNEALED • HEAT-TREATED
STRAIN RELIEVED**

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Works at: Ambridge, Pa. • Chicago, Ill.
Newark, N.J. • Putnam, Conn.

(Continued from page 206)

Syracuse and Central New York, held in the Onondaga Hotel. His subject was "Business Indices—How They Are Prepared, and How Best to Interpret Them". The committee headed by Willard Hoffman gave a report on the commodity situation.

♦ ♦ ♦

**CINCINNATI ASSN. TO HOLD
MEMBER-LADY DANCE APRIL 21**

The annual Member-Lady Dance of the Cincinnati Association of Purchasing Agents has been scheduled for Saturday, April 21. It will be held at Forest View Gardens.

♦ ♦ ♦

**"QUALITY IN THE MAKING"
DALLAS MEETING TOPIC**

A regular meeting of the Purchasing Agents Association of Dallas was held on Thursday, January 25, at the Melrose Hotel. Guest speaker was Howard Hall, district representative for New Departure Ball Bearings. Mr. Hall presented a film entitled "Quality in the Making", showing the intricate processes involved in manufacturing bearings.

Lt. Col. James H. Hickerson and Capt. D. D. Trenholm Jr., of the 443rd Troop Carrier Wing, Hensley Field, were in charge of the February 8 meeting, held in the Melrose Hotel. The officers presented the films, "Your Air Force in Action", and "Power for Peace".

♦ ♦ ♦

**"DANGERS OF WAR INFLATION"
TULSA ASSOCIATION TOPIC**

An open meeting of the Purchasing Agents Association of Tulsa was held on February 13. Guest speaker was Morris M. Blair, Ph. D., professor of economics at the University of Tulsa. Dr. Blair spoke on "Dangers of War Inflation".

A second feature of the program was the documentary motion picture "24 Hours of Progress", which depicts the round-the-clock role of oil in the modern world. The film was prepared and is distributed by the oil industry information committee of the American Petroleum Institute.

An official of the National Production Authority is expected to be the guest speaker at the association's March 13 meeting.

♦ ♦ ♦

**NEW ORLEANS ASSOCIATION SEES
"PARTNERS IN PURCHASING"**

A regular monthly dinner meeting of the Purchasing Agents Association of New Orleans was held at the Jung Hotel on Monday, February 12. A demonstration of how buyer-seller relationships can be satisfactorily coordinated was presented by means of the color motion picture "Partners in Purchasing." The film was first shown during the N.A.P.A. visual program at the Cleveland convention.

(Please turn to page 212)



**HAND
CLEANERS**

Skilled hands are a valuable asset to management, as well as an important responsibility of it. Mione Hand Cleaners can insure that asset by helping to share the responsibility for keeping skilled hands in prime working condition.

WORKERS like the quick-lathering, gentle-scrubbing, easy-rinsing action of Mione. And its very definite skin conditioning value.

MANAGEMENT likes the safe, sanitary, efficient, trouble-free Mione features, plus its economy per pound, low cost per scrub-up, and the basic economy of skilled hands always at top productivity.

YOUR SUPPLIER of washroom needs can give you full particulars about Mione so that you, too, can benefit from the know-how gained from 40 years of making nothing but better and better soap for the hands.

**WRITE US FOR THE NAME OF THE
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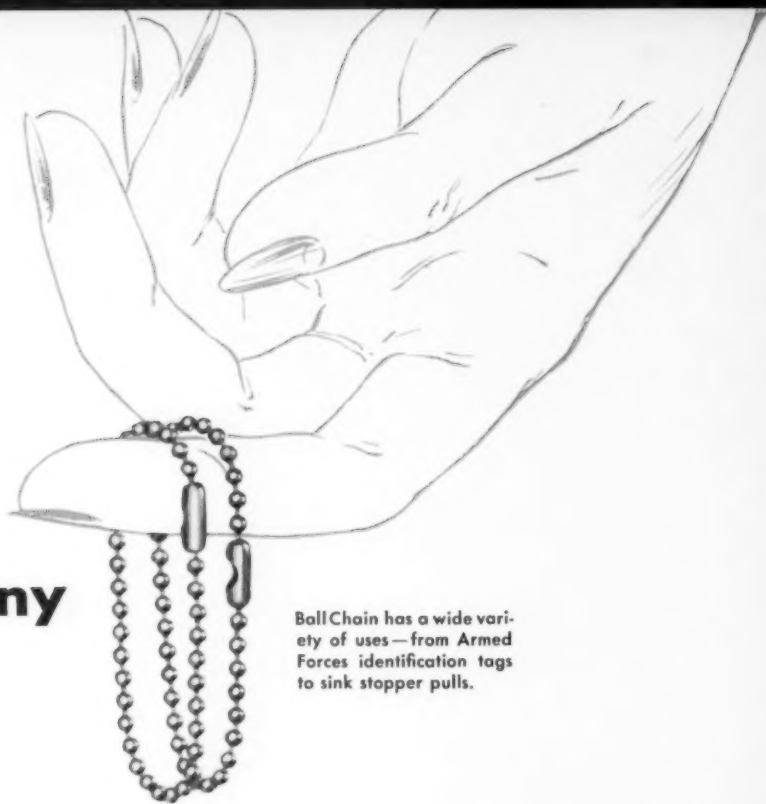
**MANUFACTURING
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Makers of famous hand soaps
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COLLINGDALE PENNSYLVANIA

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... two for a penny



Ball Chain has a wide variety of uses—from Armed Forces identification tags to sink stopper pulls.

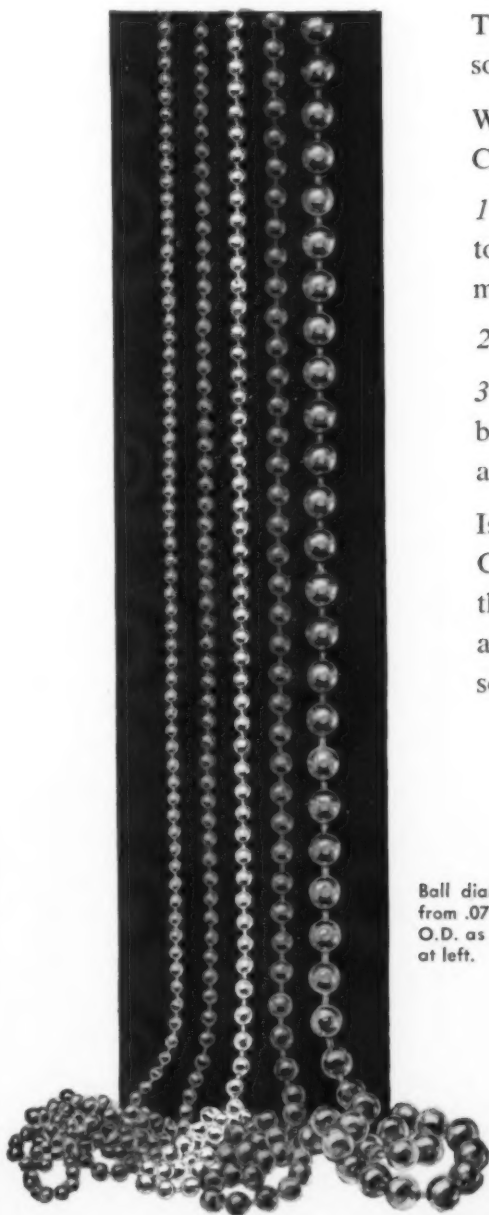
That, roughly, is the manufacturer's price in quantity for these solid brass key chains.

What makes it possible? These three factors, as outlined by the Ball Chain Manufacturing Co., Inc., of Mount Vernon, New York:

1. Ingenuity in the design of multiple dies of extremely close tolerances . . . and their adaptation to specially developed automatic equipment.
2. High production over long periods.
3. Uncompromising standards of quality in every mill shipment of brass, copper or nickel silver strip necessary for the fabrication of a wide variety of Ball Chains and attachments.

Isn't it significant that "Ball Chain" considers The American Brass Company its most dependable source of supply for metals made to the most exacting requirements; composition, anneal, flatness across the entire strip width, and uniform gage of metal which, in some instances, must be within .00025".

51101



Ball diameters vary from .072" to .187" O.D. as illustrated at left.

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COPPER • BRASS • BRONZE



WHEREVER METAL TAKES A BEATING

... in manufacturing, in service, or both—
no other alloys possess the combination of
properties of Phosphor Bronze. And *nowhere* is
finer Phosphor Bronze produced than in
the mills of The American Brass Company—
in sheet, wire, rod and tube.

*Illustrated here are a few of the myriad of
bellows and bellows devices made of Anaconda
Phosphor Bronze and other Copper Alloys by
The Bridgeport Thermostat Division of Robertshaw
Fulton Controls Co., Bridgeport, Conn.*

ANACONDA
PHOSPHOR BRONZE

HIGH

Tensile strength
Elastic limit
Resistance to fatigue
Resistance to corrosion
Resistance to wear



EVER SHAKE HANDS WITH A DOOR?

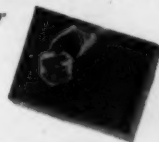
One of civilization's most important, most *used* inventions is paradoxically one of its least appreciated. Few manufactured objects have such close, subconscious, personal meaning to every individual as do the doors in his life. More than a million times in his lifetime, his entrances and exits, his privacy or his hospitality are all tied in with doors.

To each, there are some doors that hold particular significance. Whether at home, church, school, or business, they are deep in special meaning. Through the centuries, from the earliest recorded time, doors have played a fascinating part in the unfolding drama of civilization.

Statisticians estimate that there are nine doors for every man, woman and child in the United States—twelve or more in the average house. Helping to supply this need, Georgia-Pacific manufactures 5,000 doors of all types per day—over a million a year. These are panel doors and flush doors in soft and hardwoods, for indoor or outdoor use, garage doors, screen doors and sliding doors. G-P doors represent about ten per cent of Georgia-Pacific's volume. They are an impor-

tant part of the "New Dimension" of quality products and nationwide services that bring you forest products more efficiently, more economically.

BUSINESS EXECUTIVES—For a modern approach to plywood, lumber and door buying, write on your company letterhead for a copy of this 20-page full color booklet—A "New Dimension," Georgia-Pacific Plywood & Lumber Co., 610 North Capitol Way, Olympia, Wash.



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Preferred power for portable grinders and a wide range of other equipment for railroad maintenance — the world's most widely used single-cylinder gasoline engines on machines and tools for industry, construction, railroads, oil fields, etc., and on appliances and equipment for farm and home.

ONLY Briggs & Stratton can give you the benefits of more than 30 years of air-cooled power experience —

gained in the production of more than 5,000,000 single-cylinder, 4-cycle, air-cooled gasoline engines.

Briggs & Stratton Corporation, Milwaukee 1, Wis., U.S.A.

In the automotive field Briggs & Stratton is the recognized leader and world's largest producer of locks, keys and related equipment.

HAWAII ASSOCIATION HEARS TALK ON NPA REGULATIONS

A regular luncheon meeting of the Purchasing Agents Association of Hawaii was held on February 8. Guest speaker was Fred Kingman, local National Production Authority representative. Mr. Kingman discussed the latest N.P.A. regulations and their application to purchasing.

Members of the association visited the Honolulu Construction & Drayage Company's Middle Street plant on January 25. Refreshments and dinner were served following the tour.

♦ ♦ ♦

CURRENT PURCHASING PROBLEMS DISCUSSED BY FT. WORTH ASSN.

A discussion on "Current Problems of Purchasing, Steel-Oil", was the feature of the January meeting held in the Worth Hotel by the Purchasing Agents Association of Fort Worth. W. R. Casstevens and R. C. Fast led the discussions. Leo Leahy described the newest national releases.

♦ ♦ ♦

ST. LOUIS ASSN. HAS PANEL ON REGULATIONS, CONTROLS

A regular meeting of the Purchasing Agents Association of St. Louis was held on Tuesday, January 23, in the Hotel Sheraton. The meeting featured a panel discussion on "N.P.A. Regulations and Controls". Panel members were J. D. Eby, Wagner Electric Co.; M. B. Covell, Union Electric Co.; R. H. Thoma, National Lead Co., Titanium Division; Wm. M. Bridwell, General Steel Casting Co. R. H. Sperrang acted as moderator.

Alf. W. Pauley, Lambert Pharmacal Company, chairman of the public relations and publicity committee, gave a talk on "Why Public Relations".

♦ ♦ ♦

COLUMBUS ASSOCIATION HAS ANNUAL WINTER FESTIVAL

The annual midwinter festival of the Purchasing Agents Association of Columbus was held on January 31 in the Southern Hotel. Guest speaker was Prof. William C. Craig, head of the department of speech at the college of Wooster. The program included a floor show.

♦ ♦ ♦

MONTREAL ASSOCIATION HAS LADIES' NIGHT MEETING

The annual Ladies Night meeting of the Purchasing Agents Association of Montreal was held on Thursday, February 22, in the ballroom of the Mount Royal Hotel. Dinner, dancing, and an excellent floor show were featured.

Among the association events scheduled are: meeting on March 20 at which successful candidates in the course conducted by John Crawford at Sir George Williams College will be guests; Executives' Night meeting, featuring an outstanding speaker, on April 17; the Annual Meeting on May 15.

(Please turn to page 214)



This Firefighter can be two places at once!

You can protect several danger spots at one time with a Kidde built-in carbon dioxide fire extinguishing system. ¶ Widely separated fire hazards...even on different floors can be protected by a single Kidde system. If fire strikes a protected space, directional valves rush fire-smothering carbon dioxide gas to the stricken area. The same CO₂ can set off mechanisms to shut doors and windows...turn off fans and machinery. After doing its job, the clean, dry CO₂ evaporates completely. ¶ Whatever your fire detection and protection problem may be, a Kidde expert will be glad to help. When you think of CO₂ call Kidde.

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Highest quality carbon steel blade, safelocks in 5 positions. Unbreakable plastic handles in six lustrous colors.

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Ingenuous combination of wind shield ice scraper, key chain and coin holder. Holds 2 nickels and 2 pennies—always ready for parking meter.



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- ☐ "One-Hand" Knife
- ☐ Razor-Nife and Key Chain
- ☐ Letter Opener
- ☐ Nail File
- ☐ Thimble
- ☐ Stir Stix

- ☐ Bracelet Key Holder
- ☐ Shoe Horn
- ☐ Key Tag
- ☐ Match Pac
- ☐ Par-Kit

☐ The items you illustrate do not fully satisfy my needs, so please send me your complete catalog and full information. (PLEASE PRINT)

NAME _____ TITLE _____

COMPANY _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

PURCHASING—SALES RELATIONS CHATTANOOGA ASSN. SUBJECT

D. J. Early, manager of sales, Birmingham Division, Tennessee Coal, Iron & Railroad Company, Birmingham, Ala., was guest speaker at the January meeting of the Purchasing Agents Association of Chattanooga. Mr. Early's subject was "Relations Between the Purchasing Agent and the Sales Representative".

PURCHASING EDITOR OUTLINES CONTROLS PICTURE TO NEW YORK ASSOCIATION

A. N. Weeksler, Washington Editor of PURCHASING Magazine, presented the regular February meeting of the Purchasing Agents Association of New York with an up-to-the-minute picture of the controls situation. The meeting was held at the Builders Exchange Club on February 20.

Mr. Weeksler gave a comprehensive outline of governmental action to date, its similarities and differences as compared with what occurred in World War II, and its significance to purchasing. His talk was entitled "Controls on Purchasing—What, When, Where?"

After Mr. Weeksler's talk—which contained latest news from Government agencies telephoned in a few hours before the meeting—copies of the National Production Authority booklet on "Inventory Control and Priorities—Answers to 85 Questions", were distributed. A long and lively question and answer period followed.

Subject of the afternoon forum was "The P.A.'s Responsibility Regarding Inventory Policies". Among the questions discussed were: Where does the responsibility begin and end? Who keeps the records and why? Who determines "working inventory" requirements? How do requirements change from month to month or week to week? Discussing the subject from three points of view were F. J. Murphy, Combustion Engineering & Superheater, Inc.; F. A. Hook, Esso Standard Oil Company, and C. W. Goodman, Union Carbide & Carbon Company. W. P. Durland, Celanese Corporation of America presided.

LANCASTER CLUB MEETING

A regular meeting of the Purchasing Agents Club of Lancaster was held on February 20 at the "Arcadia". Guest speaker was Emmet Malloy, who spoke on "The American Economic System".

CHICAGO PRODUCTS SHOW ENDS WITH ANNUAL BANQUET

The 17th annual Products Show of the Purchasing Agents Association of Chicago was brought to a successful close on Thursday, February 22 with the traditional banquet.

The show had run for three days, drawing an estimated attendance of more (Please turn to page 218)

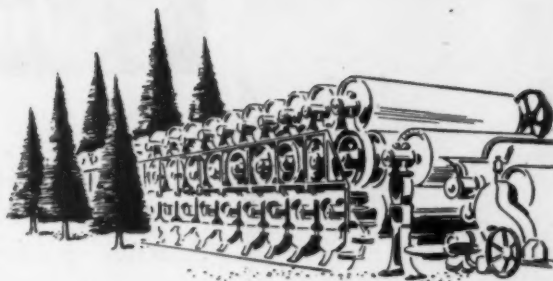
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a fast towel delivery service. Nationwide distribution and high mill production put these towels in your hands when you need them.

Nibroc — World's largest selling towel for Industrial and Institutional Use



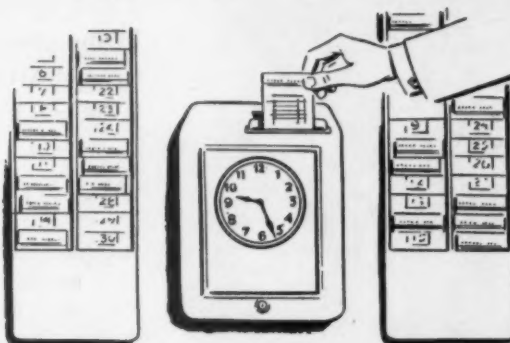
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a dependable supply of quality towels year in and year out—made by *one* company from timber-cutting to finishing. One Brown Company machine alone, called "Mr. Nibroc," can produce nearly 30 million towels a day.



NIBROC means

modern, sanitary drying. Individual towels help prevent spreading of infection and colds, help reduce absenteeism.



NIBROC means

quick drying towels. No time-consuming gadgets to fuss with. Reduces time spent in washroom. Gets employees back on the job faster.

Sparkling white Nibroc cabinets in your washroom mean fresh, soft, absorbent, lint-free personal towels for everyone. And Nibroc dependable service offers you a wide range of towels—singlefold and multifold, white or buff—to meet every washroom requirement.

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GET A BID FROM ALCOA on assembly-certified* screw machine parts. Your local Alcoa specialist is listed under "aluminum" in the classified phone book. Or send prints to ALUMINUM COMPANY OF AMERICA, 853C Gulf Building, Pittsburgh 19, Penna.

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Machines—Turret lathes, single and multiple-spindle automatics—handling all types of rod, bar and tubing up to 3½ inches in diameter.

Second Operations—Drilling, reaming, tapping, milling, slotting, centerless grinding, press forming, thread rolling, marking, stamping, knurling and many others.

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ALCOA

ALUMINUM SCREW MACHINE
PRODUCTS FOR DEFENSE



Blue it...

Mark it...

Saw it...



... that's all you have to do with

SIMONDS

FLAT GROUND DIE STEEL

(Flat Ground Stock)

... to make dies, punches, templates, gages, jigs, fixtures and machine parts

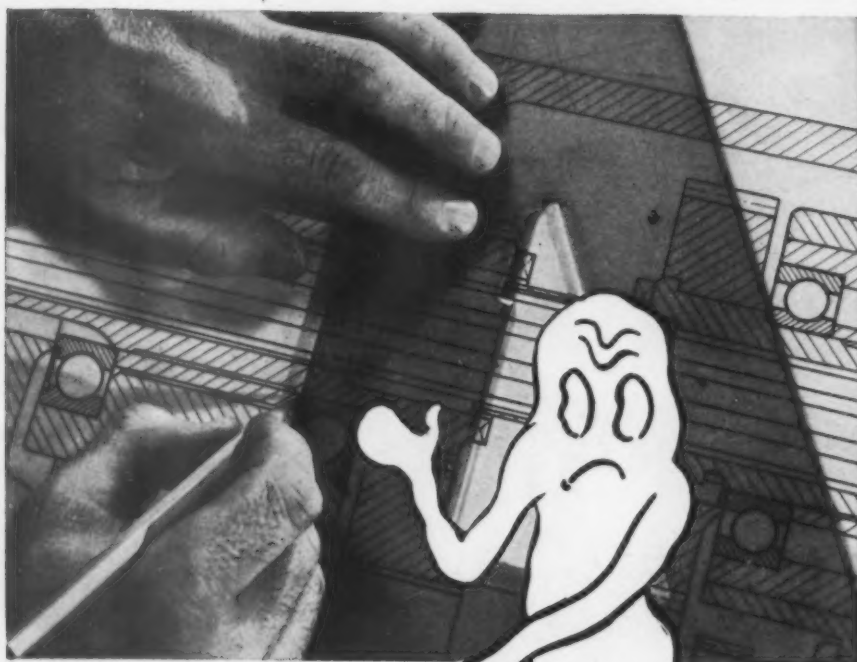
You can bank on this *oil hardening, non-deforming* type flat ground steel to be uniformly annealed and to have a uniformly low micro-inch surface finish needed for accurate layout work. Ends of the standard 18" lengths are milled square. No machining operations are required to size Simonds "Red Streak" Flat Ground stock and Die Steel... so you save time and money right from the start.

Another feature is its wide hardening range (1450° to 1540°) which insures consistently uniform results. Each piece is individually packaged, plainly marked as to size, and includes heat-treating instructions. Now furnished in a wide range of sizes up to 36" x 10" x 1½", you can get immediate delivery of most sizes from your Simonds Distributor.



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Branch Offices in Boston, Chicago,
San Francisco and Portland, Ore.
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Ever been haunted by an "ERASURE GHOST"?

The beauty of Arkwright Tracing Cloth is its permanent translucency — built all the way through the cloth by a special process. Arkwright will take the heaviest erasures without "ghosting". You can count on clear, clean prints from drawings on Arkwright cloth years after you make them.

You can re-ink over erasures on Arkwright Tracing Cloth without feathering or "blobbing". You can be sure there are no pinholes, thick threads or other imperfections in the cloth to bother you. Every roll is carefully inspected before leaving the factory.

Think a moment. Isn't it an unnecessary risk to put your important drawings on inferior tracing cloth or paper? A sample will show you the difference. Write Arkwright Finishing Company, Providence, R.I.

ARKWRIGHT

Tracing Cloths

AMERICA'S STANDARD FOR OVER 25 YEARS



than 15,000. Over 100 exhibitors demonstrated their 1951 lines during the affair.

Guest speaker at the banquet was Rev. Laurence Hall, a noted humorist, equally known for his social welfare work. Rev. Hall is the rector of All Saints' Episcopal Church, Portsmouth, Ohio.

Clarence M. Oberling, director of purchases, National Lock Company, who enjoys an outstanding reputation for humor, in addition to his business abilities, acted as toastmaster.

♦ ♦ ♦

N.A.E.B. TO HOLD ANNUAL CONVENTION IN DETROIT

The thirtieth annual convention of the National Association of Educational Buyers will be held in the Hotel Statler, Detroit, Mich., on May 2 to 5.

Among the prominent speakers scheduled to appear are Theodore O. Yntema, vice-president in charge of finance for the Ford Motor Company, who is now chief economist for the Economic Stabilization Administration, and Ralph Lee of the General Motors Corporation department of public relations. Mr. Yntema, who went to Ford from the University of Chicago, will speak on "The Economic Future of Higher Education".

Another feature of the meeting will be additional skits on the buyer-seller relationship. These skits, first presented last year in Houston, are under the direction of Leslie F. Robbins, purchasing agent, University of Colorado.

As in former years, numerous producers of materials and equipment bought by colleges and universities will exhibit their products.

Program chairman is Kermit A. Jacobson, purchasing agent of California Institute of Technology. Chairman of the host committee is Ray Ammerman, purchasing agent of Wayne University.

Preliminary information on all aspects of the meeting may be obtained from Bert Ahrens, N.A.E.B. executive secretary, at 45 Astor Place, New York, N. Y.

♦ ♦ ♦

ENGINEER GUEST SPEAKER AT PITTSBURGH MEETING

A closed meeting of the Purchasing Agents Association of Pittsburgh was held in the Hotel William Penn on Tuesday, February 20. Guest speaker was S. J. Rosch, consulting engineer of the Anaconda Wire and Cable Company.

Mr. Rosch, who had appeared that afternoon at a session of the Public Utility Buyers' annual conference in Pittsburgh, had as his subject "Adventures in Modern Industrial Research."

See Purchasing's
Buyer's and Seller's Mart
Page 344

We both
consider the people
as our Children
and love them
with parental affection

But YOU love them
as the
whom you are afraid
to trust
without nurses

and I as Adults whom I
freely leave to
self-government

Thomas Jefferson



CONTAINER CORPORATION OF AMERICA

INTRODUCING A PANELBOARD WITH A PLASTISOL HEART

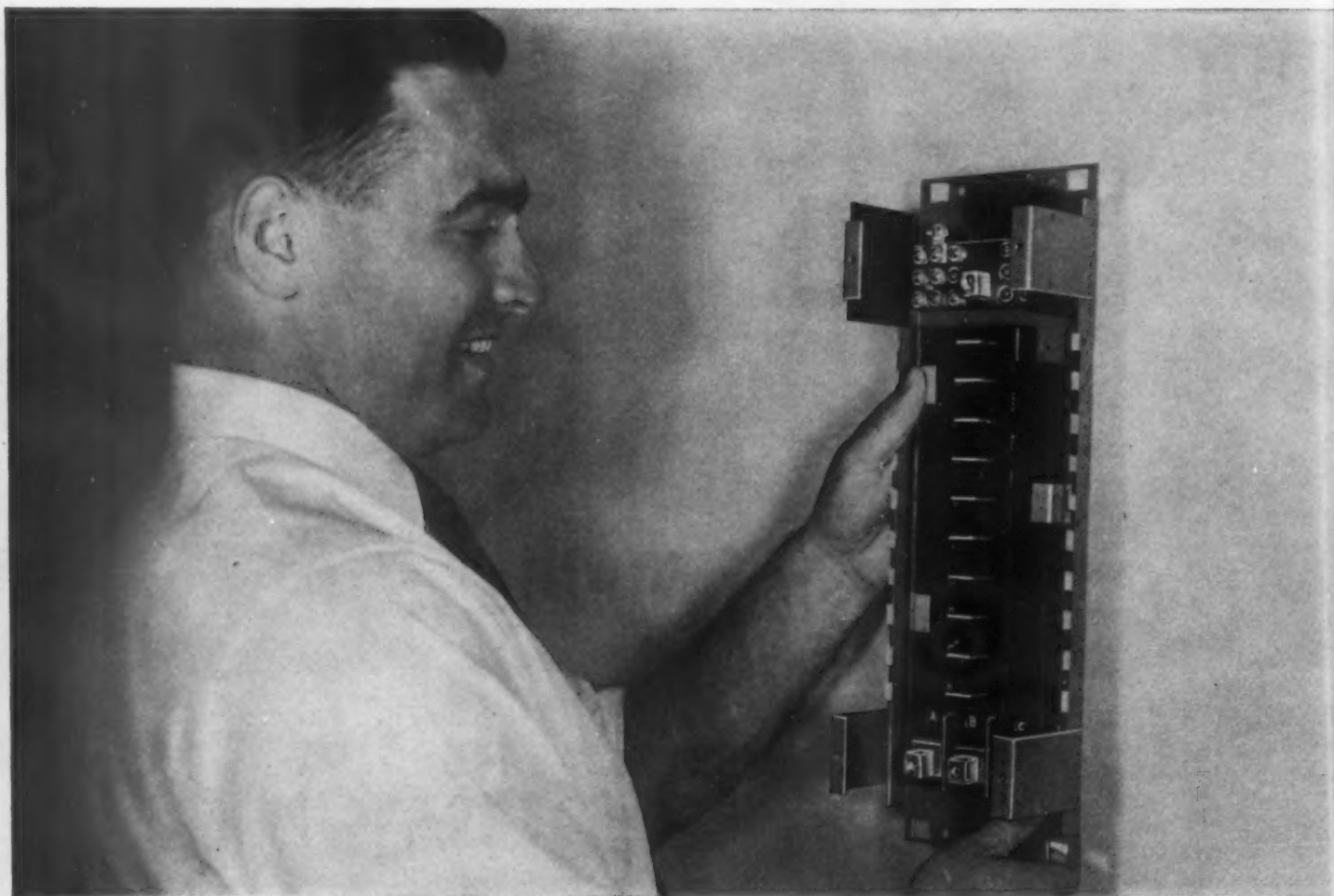
Now—for the first time—a new insulating material, Plastisol, is used as the heart of a complete line of panelboards.

The interior of Trumbull's new NLTQ Panelboard is formed with bus bars *molded in* a plastisol base. This plastisol material has many advantages over all other types of insulation: highly resistant to either acid or alkali; no harmful aging; no shrinking or embrittlement; highly resistant to tracking and carbonizing; will withstand temperatures of 212 F without harm; has very high thermal conductivity (even at minus 30 F) and is an excellent radiator of heat. Tests show

copper bus bars encased in plastisol run 10% cooler than in open air!

Trumbull's plastisol base is Underwriters' Laboratories, Inc. approved, and is completely endorsed by The Electrical Council.

The NLTQ Panelboard is furnished with lug-in mains or circuit breaker mains in capacities up to 225 ampere bus bars, in a range of 4 to 42 circuits. 3-wire, 120/240 volt A-C or 4-wire, 3-phase, 120/208 volt A-C, solid neutral. Provision can be made for increasing any bus capacity up to 210 amperes; also sub-feed, meter loop, through feed and split bus. **Write for Bulletin TEB-14.**



NEW INTERIOR SAVES INSTALLATION TIME, PROVIDES SEQUENCE PHASING

The interior is compact, allowing ample room for wiring. As shown in the picture at the right, it is mounted in the box by means of four posts and compression springs; this speeds installation, permits removal for ease in wiring.

The bus bar and stab assembly is silver-plated copper for positive conductivity. Line terminals are heavy-duty,

silver-plated, solderless.

Another unique feature of this interior is that by ingenious design, sequence phasing is built into the Panelboard. Each adjacent Breaker is on an alternate phase which assures balanced loads and circuits.

Phases are permanently identified by molded-in letters

You've never before seen a **CIRCUIT BREAKER** like this in a panelboard



QUICK-MAKE, QUICK-BREAK Trumbull's new TQL interrupts with a *snap*. No matter how sloppily the handle is operated, the movable contact arm (A) opens or closes *fast and clean*... reduces burning or arcing of contacts.

DOUBLE PROTECTION *thermal and magnetic* Trumbull's new TQL trips automatically by (B) time-delay thermal action of excessive overload (but not by harmless temporary overloads) or by (C) instantaneous magnetic action for short circuit.

TRIP-INDICATING When an overload or short circuit causes the Breaker to trip, the handle (D) moves to mid-position between OFF and ON where it is easily observed from a distance.

TRIP-FREE Trumbull's new TQL Breaker automatically trips independently of the handle—it trips for a fault condition even though handle is held in ON position.

OTHER FEATURES Pressure-type silver-plated copper contacts (E)... arc chute (F) made of special refractory material... exhaust chamber (G) to cool gases... completely tamper-proof... Underwriters' Laboratories Inc. approved.

INTERCHANGEABLE All ampere ratings are physically interchangeable.

RATINGS 15, 20, 30, 40, 50 amp; 120 volt A-C, single pole, single throw. Interrupting: 5000 amp. 120 volt A-C, 120/240 volt A-C. Two-pole operation, independent trip, possible with handle extensions.



COMPRESSION SPRINGS save nuisance of nuts and washers, allow fronts to be lined up regardless of uneven box installation.



ONE-PIECE WELDED ASSEMBLY of front and barrier saves installation time. Front is attached to interior by means of four screws.



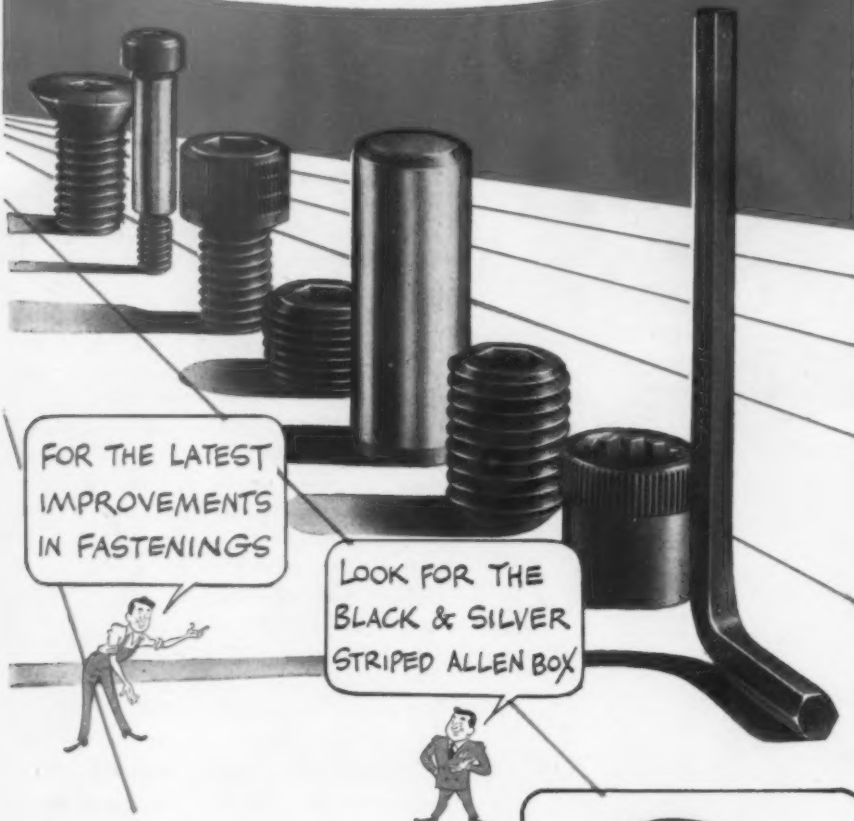
COMPLETELY PROTECTED With door locked, screws are concealed, front cannot be removed. Note attractive appearance; invisible hinges.

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THE TRUMBULL ELECTRIC MANUFACTURING COMPANY

PLAINVILLE, CONN.

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IMPROVEMENTS
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STRIPED ALLEN BOX



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Not all the improvements are made first by Allen but a very large percentage of them are. Some of the most important have yet to be duplicated even after years of trying.

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IF YOU ARE DESIGNING OR IMPROVING A PRODUCT . . .

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ZINC INSTITUTE ANNUAL TO BE HELD IN ST. LOUIS

The Thirty-third annual meeting of the American Zinc Institute, will be held at the Hotel Statler, St. Louis, Mo., Monday and Tuesday, May 21st and 22nd. Government officials will be present to discuss Washington plans and policies, and qualified speakers will review the general outlook for metals and the current situation in zinc mining and smelting production at home and abroad. Ernest V. Gent is executive vice president and secretary of the American Zinc Institute, 60 E. 42nd St., New York, N. Y.

BUILD 80,000 LB. CAPACITY LIFT TRUCK FOR STEEL INDUSTRY

The completion of an 80,000 pound capacity industrial lift truck, was recently announced by the Yale & Towne Manufacturing Company's Philadelphia Division. Built for the steel industry, this giant truck is designed to slash handling time, hike output and increase quality of cold rolled strip steel now in critical supply.




Weighing-in at 84,000 lbs., the new truck is powered by a unique diesel-electric unit of the same size used in a 25-ton locomotive. On the front of the truck are two huge, snout-like rams that open and close like a scissors. These rams provide a unit that can carry one large coil or steel or two smaller ones. Use of the truck will permit an increase of coil sizes from today's normal 30,000 or 40,000 pound coils, to 60,000 or even 80,000 pounds coils. It is pointed out that by doubling the size of the coils handled, steel mills will not only slash the handling time per pound of steel, but also improve the quality and yield per coil, since the ends of coils rolled while the strip mill is accelerating and decelerating are, for the most part, off-gage and rejected.

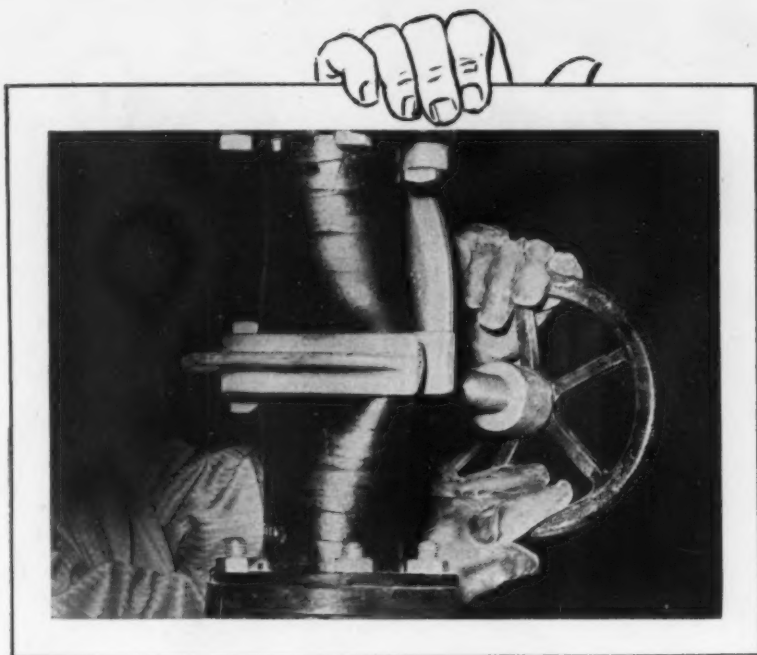
Over-all height of the truck is 178"; over-all width, 124"; lifting height 91"; turning radius 168" (14' aisle); power unit, 165 hp Cummins diesel engine driving a 90 kw GE locomotive type generator. Descriptive folder giving detailed information and illustrations, is available on request.

(Please turn to page 226)

ASK RAYTHEON:

Allen  Head screws are required to meet the standards of most of the Raytheon products manufactured on Government contracts; hence they are used widely on the equipment made by this prominent manufacturer.





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"Here's a valve made with a fabric reinforced body of tough Du Pont neoprene. It's designed to cut maintenance costs in operations where destructive materials are handled. It often outwears metal in lines carrying abrasive or corrosive mixtures. And even when handling difficult materials like sand and water solutions, acids or dry solids such as powdered coal, rapid and complete closure is obtained. And neoprene's resistance to abrasion and deterioration from contact with oil, gasoline and most chemicals assures maximum efficiency and long service life."

Just as neoprene improves the performance of this pinch valve, it contributes greater efficiency and longer life to many more of industry's finest quality rubber products. Du Pont makes no finished products of neoprene, but your rubber goods manufacturer or distributor will be glad to tell you about the neoprene products he supplies.

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but it's used
to make a
woolen suit



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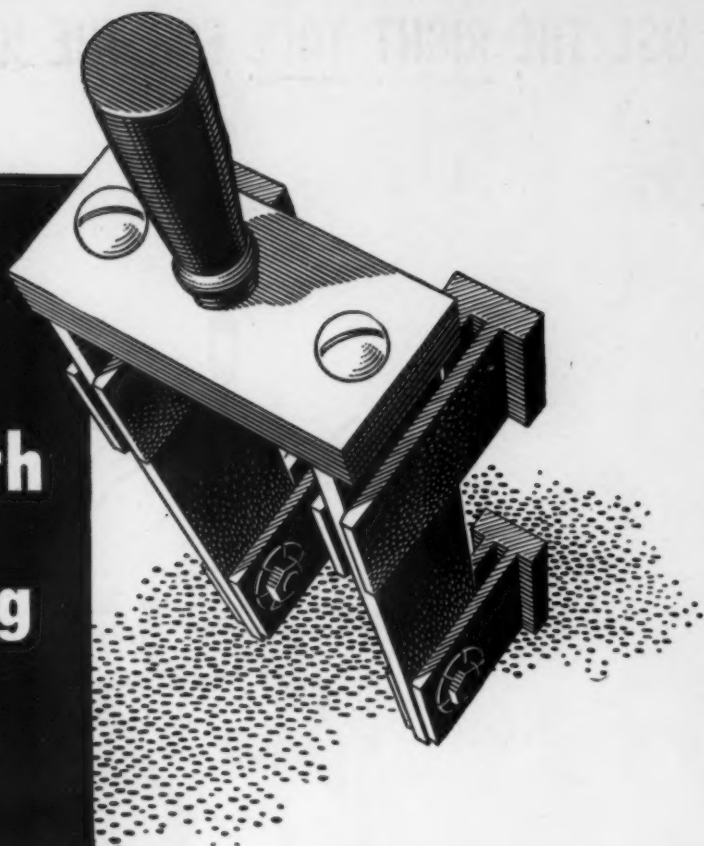
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Every day the machinery in a Clinton, Mass. plant* had to be stopped for a half hour while those machines were lubricated. Every stop meant lost production time plus a \$14 expenditure for lubrication.

The Clinton people called in an Alemite Lubrication Engineer. They wanted to know if they could eliminate the costly interruption in production time. They felt that lubrication was costing them too much.

The Alemite Lubrication Engineer studied their problem and recommended a system that automatically lubricates the machinery without any shut-down. What's more, lubrication cost was cut from \$14 a day to only 21¢ a day. That saving alone paid for the entire investment in just 43 days.

Call Your Alemite Lubrication Engineer
No matter what size or type of plant you operate, Alemite can show you

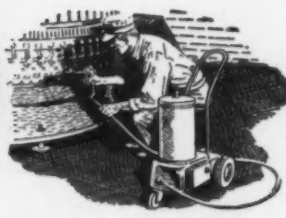
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cuts man hours 63% for every 100 pounds transferred. No mess, no contamination.



2. In loading grease guns...
saves 3¾ man hours for every 100 pounds of lubricant loaded into hand guns.



3. In applying lubricants...
saves up to 23.9 man hours for every 100 pounds of lubricant applied to bearings.

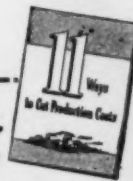
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*Name on request.

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He'll tell you why!

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THE BILLINGS & SPENCER CO. HARTFORD 1, CONN. U.S.A.

SYNTHETIC FUEL PROCESSES SOURCE OF STRATEGIC CHEMICALS

Synthetic fuel processes can play an important part in meeting requirements for strategic chemicals used in the manufacture of such essential products as synthetic rubber, plastics and nylon, declared James Boyd, director of the U. S. Bureau of Mines, at the 1950 annual meeting of the American Society of Mechanical Engineers in New York City.

"Current shortages and increasing requirements for benzene, phenol, toluene and certain other chemicals could accelerate the schedule for constructing the initial coal-hydrogenation plants, in view of the fact that these chemicals would be produced from such plants in important quantities," he said.

A Bureau of Mines study has determined that a coal-hydrogenation plant could be operated in such a manner that the yields of benzene, toluene and xylenes would be increased by about 25 per cent. Mr. Boyd added, however, that this would result in a proportionate reduction in the yield of gasoline.

"Many other products are obtainable from coal, but there is no present demand for them because they have never been produced in quantity. Many of these can be recovered by minor process changes," he continued.

Shale oil contains significant amounts of aromatic chemicals now in short supply, said Mr. Boyd. The Bureau of Mines has demonstrated in a laboratory unit that benzene and toluene can be obtained from oil shale by a radiant retorting process. If this same process is commercially feasible in large-scale equipment, the yields of these two chemicals would be "very impressive."

While pointing out the necessity of studying the fuel pattern as a whole, rather than any one fuel industry, in order to obtain a true picture for policy making, Mr. Boyd stated:

"The trend in technology is toward expanding the area of interfuel competition, either by introducing new devices for utilization or by increasing knowledge of converting the various fuels into forms usable in present-day equipment. An example of the developing technology of the former type is the gas-turbine locomotive burning powdered coal. The synthetic fuels illustrate the latter."

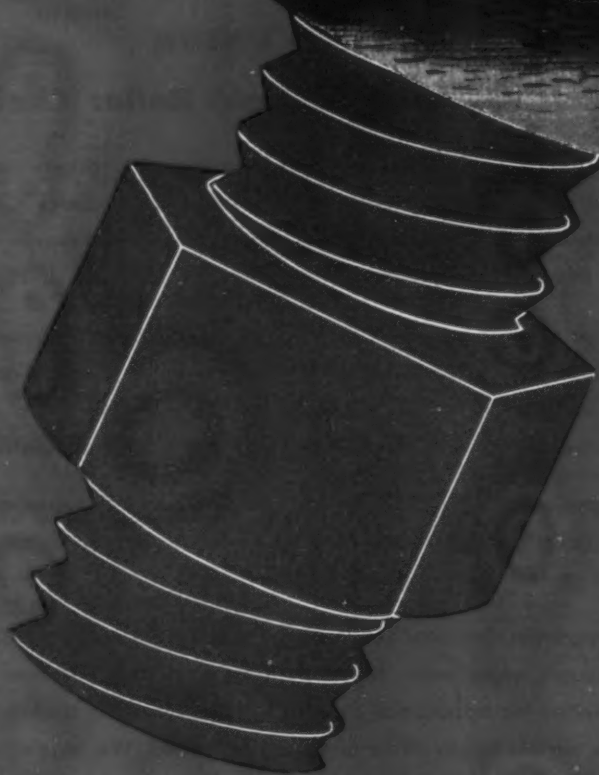
Petroleum Reserves Limited

In surveying the United States fuel supply, Mr. Boyd stated the reserves of petroleum are relatively limited. The present decade is one in which authorities in both the petroleum industry and government have indicated that domestic petroleum production probably will pass its peak and may begin to decline.

"Moreover," he continued, "they anticipate that this decade will witness the birth and initial development of a new basic industry engaged in producing synthetic liquid fuels, first from natural gas, then from oil shale and coal."

"Barring unexpected developments in atomic or solar energy, the anticipated

(Please turn to page 230)



Many makers of every type of earthmoving equipment consider Sterling Bolt Company a **primary** source of bolts, nuts and screws . . . dependable fasteners to build rugged, superior products.

Many purchasing agents (not only in that industry but in **any** manufacturing activity using nuts and bolts in volume) specify Sterling Bolt products as a step in efficient production planning.

For 30 years Sterling Bolt Company has been helping industry make **better** products for more people.

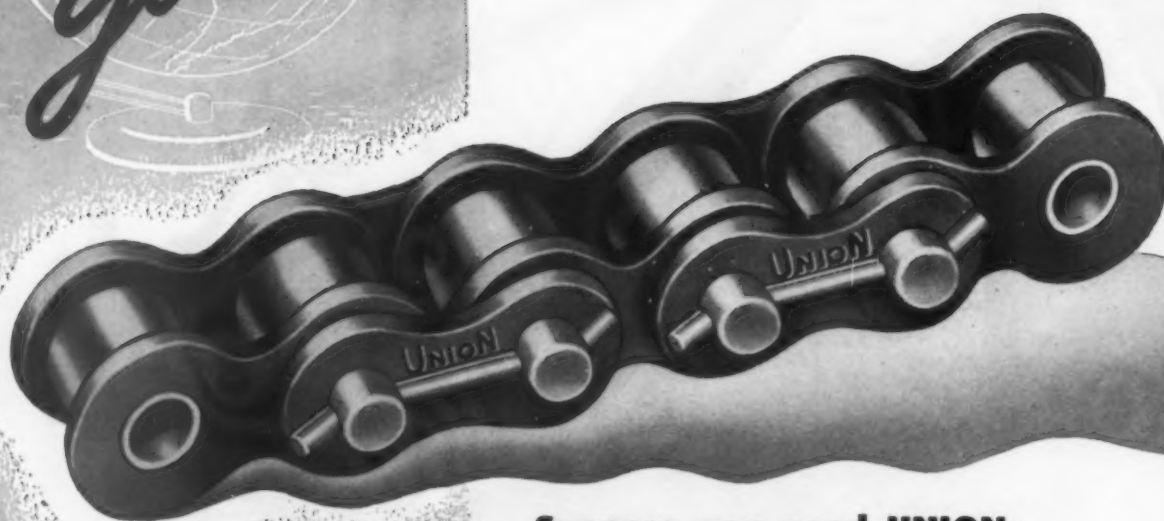
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Unprejudiced because Union Chain makes all types of steel sprocket chains and is interested in providing each customer with the correct chain for satisfactory service at minimum cost.

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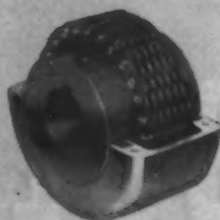


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E. F. Gahan
500 Fifth Ave.
New York, New York

OREGON
W. D. Hellingwerth
307 S. E. Hawthorne
Portland, Oregon

OHIO
Wilkef Hardware &
Supply Company
1100 Warner Road, S. E.
Canton, Ohio

Winkle Electric Co., Inc.
701 Andrews Avenue
Youngstown 2, Ohio

OKLAHOMA
C. F. Dagwell & Company
816 W. Main St.
Oklahoma City, Okla.

Ore Reclamation Company
301 N. Connell Ave.
Pitcher, Oklahoma

OREGON
Electric Steel Foundry
Eugene, Oregon
Fisher Bros. Company
322 Bond Street
Astoria, Oregon

**Industrial Machinery &
Supply Co.**
1410 Adams Avenue
La Grande, Oregon

Industrial Steel & Supply Co.
North Bend, Oregon

PENNSYLVANIA
A. C. Supply Company
1330 Federal Street
Philadelphia, Pa.

Ace Bearing Company
246 Hamilton St.
Allentown, Pa.

Ace Bearing Company
P. O. Box 183
1120 Wyoming Avenue
Scranton 1, Pa.

S. S. Brenner
2303 E. Philadelphia Street
York, Pa.

Industrial Supply Co.
451 E. Broad St.
Hazleton, Pa.

Maximen Machine Co.
801 N. Logan Blvd.
Altoona, Pa.

Reilly Bros. & Raub
44 N. Queen St.
Lancaster, Pa.

Transmission Equipment Co.
903 E. Carson St.
Pittsburgh 10, Pa.

SOUTH CAROLINA
Crawford & Garner, Inc.
Greer, S. Carolina
O'Brien Debusse Company
213 E. Evans St.
Florence, S. Carolina

Southern Mill Supply Co.
Summerville, S. Carolina

FOREIGN Representatives

ARGENTINA
Stevens & Villaluso
Munecas 110
Tucuman, Argentina

CUBA
Central Machine & Trading
Co., S.A.
Lamparilla 208
Havana, Cuba

HAWAII
P. S. Pelt & Co.
88 S. Queen Street
Honolulu, T. Hawaii

MEXICO
Thomas M. Nevin Y. Cia. S.A.
Manuel Maria Contreras 58
Mexico, D. F., Mexico

PHILIPPINES
The Edward J. Nell Co.
1450 Arlegui St.
Manila, Philippines

PUERTO RICO
Manual, Pales, Jr.
P. O. Box 2969
San Juan 13, Puerto Rico

SOUTH AFRICA
Robins Conveyors (South
Africa) Ltd.
Samkay House
Cor. Troye & Marshall Sts.
P. O. Box 4736
Johannesburg, S. Africa

SOUTH CAROLINA
Thackston-Davis Supply Co.
828 Garvais Street
Columbia, South Carolina

TENNESSEE
Hayt N. Payne Co.
P. O. Box 942
410 E. Depot Ave.
Knoxville, Tenn.

Tennessee Machinery Co.
114-119 Third Ave., South
Nashville 3, Tenn.

**Tipps Engineering &
Supply Co., Inc.**
260 N. Front St.
Memphis, Tenn.

TEXAS
Allis Belting & Trans. Co.
2614 Sylvan Ave.
Dallas, Texas

Bacon Supply Co., Inc.
1825 Washington Ave.
Houston 10, Texas

El Paso Machine Works, Inc.
1600 E. 4th St.
El Paso, Texas

Great Western Supply Co.
14th & Throckmorton
Fort Worth, Texas

Lloyd Electric Co.
511 El Paso St.
San Antonio, Texas

Overton & Mims, Inc.
1307 Indiana
Wichita Falls, Texas

VIRGINIA
Blue Ridge Hardware &
Supply Co.
Bassett, Virginia

Mill Supplies Corp.
South Norfolk, Va.

WASHINGTON
Electric Steel Foundry
1327 Washington St.
Spokane, Washington

WEST VIRGINIA
Bluefield Hardware Co.
Bluefield, W. Va.

Smith Steel Supply Co.
150 Peninsula St.
Wheeling, W. Va.

WISCONSIN
Dole Industrial Supply Co.
528 Forest St.
P. O. Box 867
Wausau, Wisconsin

Richard E. Elm Co.
744 Williamson St.
Madison, Wisconsin

The Union Chain and Manufacturing Company



Sandusky, Ohio, U.S.A.

PERMACEL News Graphic

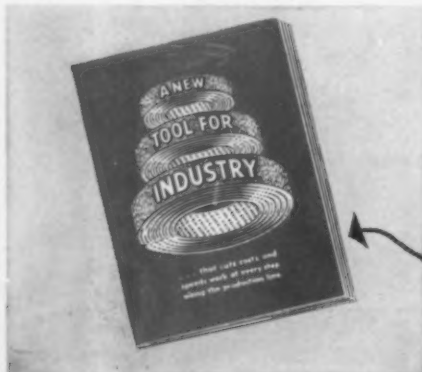
CUTTING COSTS...SPEEDING PRODUCTION WITH INDUSTRIAL TAPES



PAN AMERICAN WORLD AIRWAYS SYSTEM speeds maintenance operations with PERMACEL Tapes. Above PERMACEL-77 seals, protects air scoop and propeller shaft. PERMACEL-66 protects fuel, hydraulic, electrical lines.



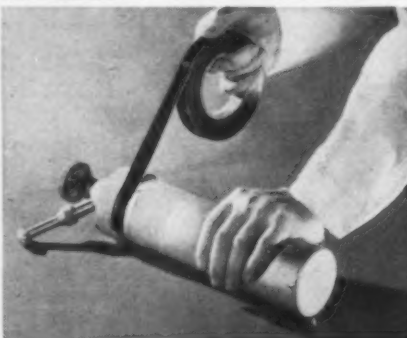
WATERPROOFING AND WEATHER-PROOFING jobs on Silver Fleet trucks call for PERMACEL-66, a flexible, plastic-coated cloth tape with high tensile strength, extremely good adhesion. Meets Government standards.



PERMACEL INDUSTRIAL TAPES

INDUSTRIAL TAPE CORPORATION,
NEW BRUNSWICK, NEW JERSEY

Makers of TEXCEL Cellophane Tape and a complete line of pressure-sensitive tapes for industry,



WHIPPED CREAM DISPENSERS are guarded against leakage at the seam edge with PERMACEL-30, a Vinyl Film Tape. This strong, thin tape is anticorrosive; has high resistance to water, oil.

FREE! HELPFUL BOOK—Write today for 12-page book packed with ideas on how you can cut costs, speed production with Industrial Tapes. Dept. 4M.

(Continued from page 226)

gap widening between domestic demand and supply will have to be met by synthetic liquid fuels and imports. It is obvious that the security of our liquid-fuels position will be greatly enhanced when the supply is based in part on solid fuels, such as coal and oil shale, which compose more than 95 per cent of our proved fuel reserves."

More Oil and Gas Fuels Used

"Since World War II, the trend toward use of oil and gas fuels has been accelerated by the construction of many long-distance pipelines to bring natural gas to major consuming areas and by the utilization of depleted gas and oil fields in the Eastern States as storage reservoirs for gas transported in summer months to augment supplies during peak demand periods in winter," Mr. Boyd said.

"Liquefied petroleum gases, used for heating and other household purposes in rural or remote areas, are today a major petroleum product. Rapid expansion in the use of Diesel engines for rail and highway transport, for construction work, and for farm equipment has increased the demand for the light fuel oils.

"There have been record installations of space-heating equipment in the postwar years, and increased quantities of heavy fuel oils have been used in generating electricity. By far the largest amount of petroleum continues to be consumed in our 44 million motor vehicles."

1 1 1

SET-UP PAPER BOX COMPETITION

The National Paper Box Manufacturers Association is sponsoring a Set-Up Paper Box Competition concurrent with its 33rd annual convention in Atlantic City June 3-6. All entries will be exhibited at the convention. The purpose of the competition is to improve the quality and sales appeal of set-up boxes by members of NPBMA by offering suitable recognition to outstanding boxes. The paper box competition committee is headed by Douglas T. Neale of Edwin J. Schoettle Company, Philadelphia, Pa. Further information in regard to the convention and the competition may be had from Gustav L. Nordstrom, executive secretary of NPBMA, 210 Fifth Avenue, New York, N. Y.

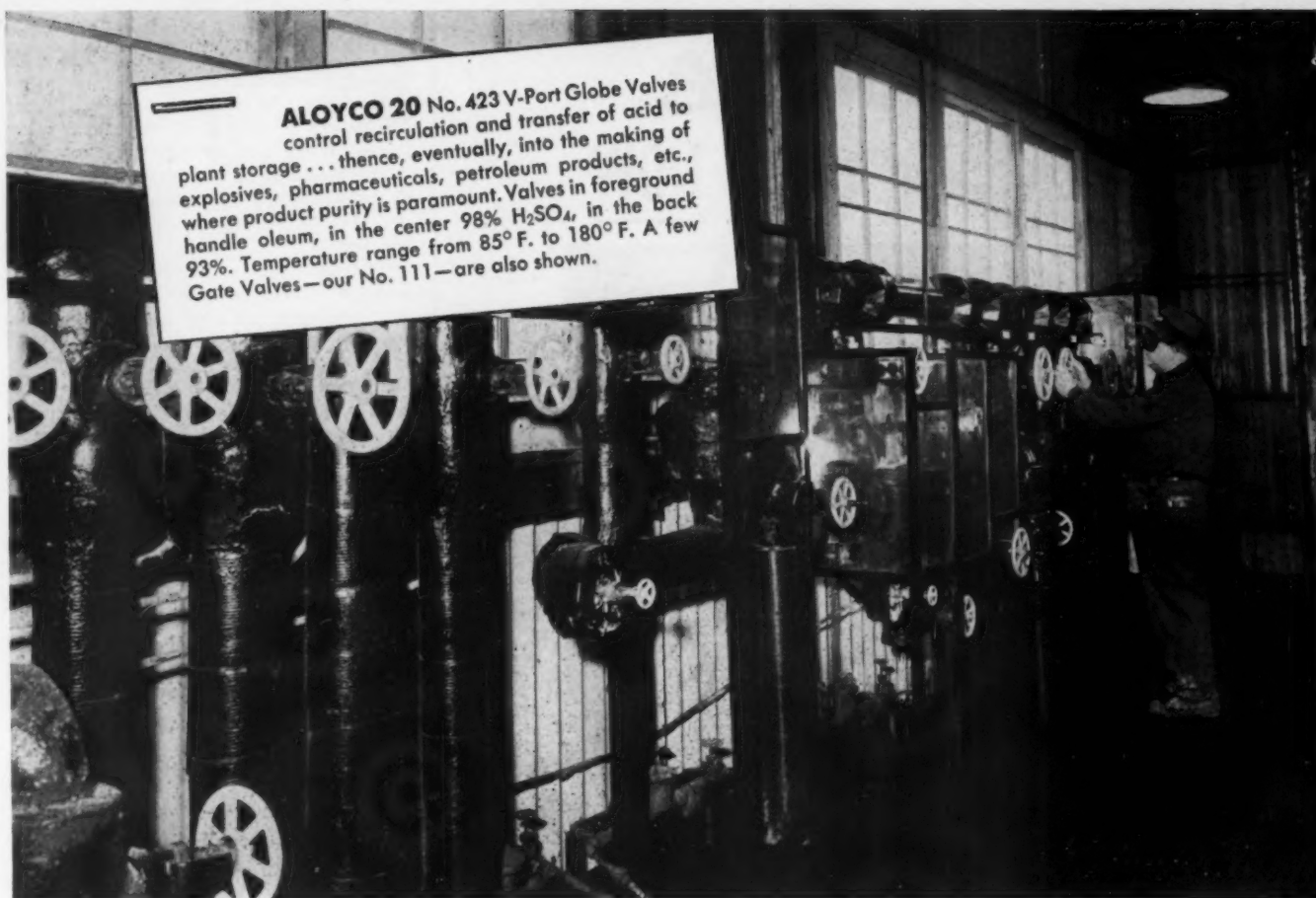
1 1 1

SELL RIVETS BY THE PIECE INSTEAD OF BY THE POUND

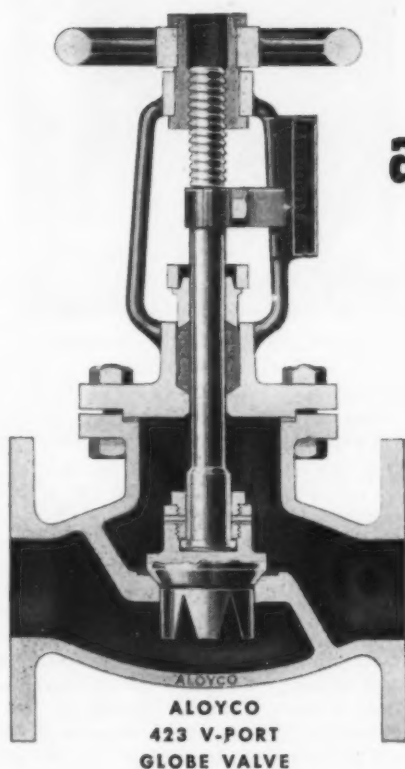
Sale of small rivets by the piece instead of by the pound, is announced by the Townsend Company, New Brighton, Pa. The new method follows the general practice in pricing bolts, screws, self-tapping screws and tubular rivets which have been sold by the piece for many years.

The company states that new price list, with a 50% discount, is designed to be the equivalent of the old pound list with 43% off. For example, under the old list most rivets having a shank of 7/32" x 5/8"

(Please turn to page 232)



ALOYCO 20 No. 423 V-Port Globe Valves control recirculation and transfer of acid to plant storage . . . thence, eventually, into the making of explosives, pharmaceuticals, petroleum products, etc., where product purity is paramount. Valves in foreground handle oleum, in the center 98% H_2SO_4 , in the back 93%. Temperature range from 85° F. to 180° F. A few Gate Valves—our No. 111—are also shown.



They Give American Cyanamid a Much Longer Run for Its Money

The photograph above shows a few of the ALOYCO valves that handle the large daily output of sulfuric acid at American Cyanamid Company's Warners plant at Lin-

den, New Jersey. Though such valves themselves represent a small item of total plant investment, *entire plant operation depends upon them.*

Continuous Use for Nearly 2 Years

These ALOYCO valves have been in uninterrupted service 24 hours a day—without the slightest maintenance—since the unit went on stream April 8, 1949.

Such performance explains why this American Cyanamid plant has for years standardized on ALOYCO

valves for corrosive service.

If your plant deals with corrosives or must guard everywhere against product contamination, think of ALOYCO valves—and Alloy Steel Products Company. Our engineers will welcome the opportunity to work with you.



ALLOY STEEL PRODUCTS COMPANY, INC.

1312 WEST ELIZABETH AVENUE, LINDEN, NEW JERSEY

Economize on cleaning costs NOW



One worker with one G. E. heavy duty cleaner can clean any surface . . . pick up small scrap for salvage . . . clean high-up, out-of-reach areas quickly and safely. By using a simple attachment, he can clean wet surfaces . . . pick up mop water, toilet overflow, drinking fountain leakage, etc.

G. E. industrial cleaners were designed after thorough survey of industrial cleaning needs. That's why G. E. cleaners have so many time and money saving features.

For instance—nozzles are extra wide (12" and 18") to cover big areas quickly. Motors have extra power to pick up industrial scraps or fine dust with equal ease. Each unit converts quickly to powerful blower for collecting coarse litter into convenient piles for easier disposal. These and other features of G. E. cleaners help you get to the root of high cleaning costs—make each of your maintenance workers more productive. **Mail coupon for details.**

Industrial Cleaners

GENERAL  ELECTRIC

GENERAL ELECTRIC COMPANY, Dept. 22-1224
1285 Boston Ave., Bridgeport 2, Conn.

Without obligation, please send complete details on heavy-duty cleaning equipment.

NAME

FIRM

ADDRESS

CITY STATE

(Continued from page 230)

sold for \$12.54 per cwt. Customer A, buying a standard round head rivet got only about 13,000 rivets while Customer B, buying a rivet with a specially designed small head, received as many as 19,000 rivets at no higher price. Customer A paid 95¢ per M while B paid 63¢ per M. The new list price for this size is 85¢ per M.

The new system eliminates a few inequities related to pound pricing. Also, all containers are now filled to the top, stopping only at even hundred or thousand counts. Rivets are sold from list in all intermediate sizes and with special heads, points and shoulders, and require a complex price sheet.

1 1 1

PORTABLE POWER SAW WILL CUT TO UNLIMITED DEPTH

A new portable power saw that handles like a handsaw, is 20 times faster, and cuts to unlimited depth, is a product of Wright Power & Saw Tool Corp., Stratford, Conn. The 14-lb. saw, which operates from any 60 cu. ft. or larger air compressor, drives twin reciprocating blades over a 4" stroke at 1500 strokes per minute.



Power combined with handsaw principle

Because the opposed motion of the blades creates a dynamic balance, there is no thrust or torque during sawing, and no "kick" on completion of a cut. A special tooth design makes the blades equally effective for cross-cutting, ripping or notching. Sawdust is thrown away from the operator and cannot clog or bind the blades.

Width of cut possible is the same as the length of the blades—21". Depth of cut is virtually unlimited. Blades are at a safe distance from the operator so that no guards are required, permitting an unobstructed view of the cutting line at all times. The kerf is 3/16". The saw stops instantly when the spring-loaded throttle is released.

Wright has indicated that it will eventually produce electric and gasoline-engine powered models of the saw.

(Please turn to page 236)



...carries a tremendous load

No other anti-friction bearing of comparable size can equal the radial capacity of Torrington Needle Bearings. A full complement of rollers distributes the load over the largest possible bearing contact surface while holding radial cross-section to a minimum.

Our engineers have solved many high-load, limited space problems with Torrington Needle Bearings. Why not let us help you with your application?

THE TORRINGTON COMPANY

Torrington, Conn.

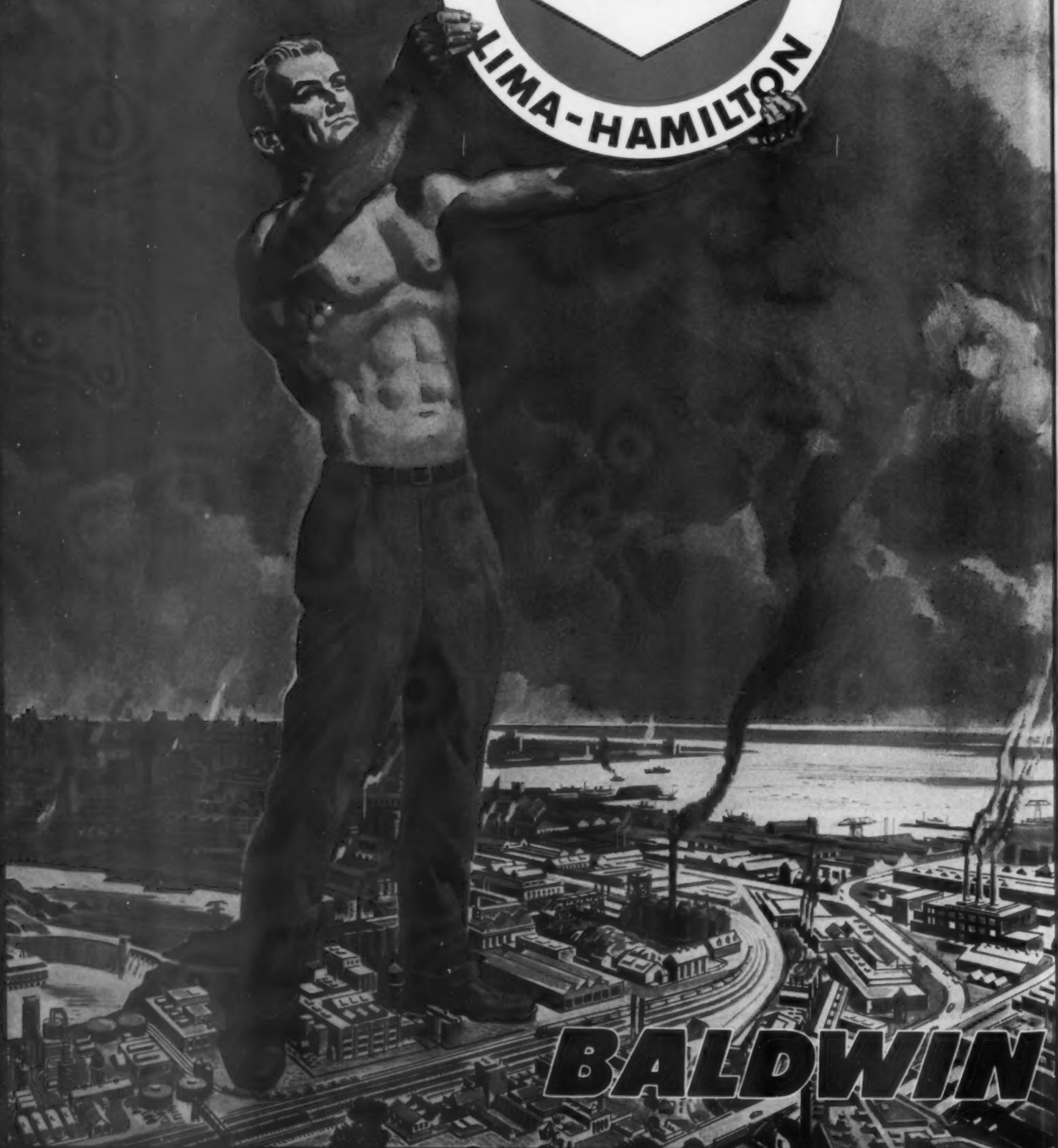
South Bend 21, Ind.

District Offices and Distributors in Principal Cities of United States and Canada

TORRINGTON *NEEDLE* BEARINGS

NEEDLE • SPHERICAL ROLLER • TAPERED ROLLER • STRAIGHT ROLLER • BALL • NEEDLE ROLLERS

A New



BALDWIN

Symbol of Service to Industry

Representing the combined facilities of two of America's leading suppliers of industrial machinery and equipment, this new Baldwin-Lima-Hamilton symbol is backed by many decades of experience, a progressive and continuing research program, and the most modern engineering and manufacturing techniques. It represents the activities of eight plants spotted from coast to coast and numerous established sales outlets, strategically located for prompt, competent service.

The dispersion of B-L-H manufacturing facilities permits "local" handling and delivery

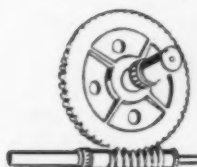
on many items to the important producing areas. It also conforms to the projected pattern for better national defense.

You have undoubtedly used many of the products offered by Baldwin, by Lima-Hamilton and by various subsidiaries, but you may not know, today, how well the Baldwin-Lima-Hamilton Corporation is equipped to supply your needs.

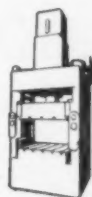
This array of products will suggest added opportunities for you to benefit from the expanded production-distribution-service facilities Baldwin-Lima-Hamilton now offers.



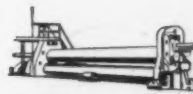
STEEL FORGINGS—Hammered and pressed steel forgings—rolled rings and flanges.



NON-FERROUS—brass and bronze alloy castings for heavy duty service.



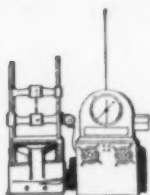
HYDRAULIC PRESSES—All types and capacities. Complete standard line.



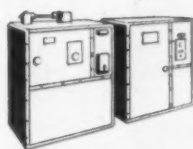
POWER TOOLS—Bending rolls for plate fabricators and ship yards.



PLATE PLANERS—With design features to maintain accuracy, increase capacity.



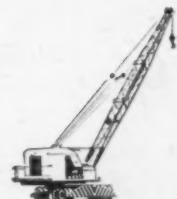
TESTING MACHINES AND INSTRUMENTS—Universal, Fatigue, Stress Analysis.



FATIGUE MACHINES—A complete range of sizes, for simulated service testing.



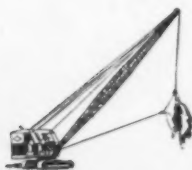
STRAIN GAGES AND INSTRUMENTS—For an accurate picture of stress distribution.



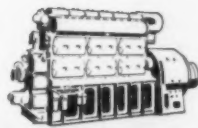
CRANES—Full range of capacities up to 110 tons, crawler and rubber mounted.



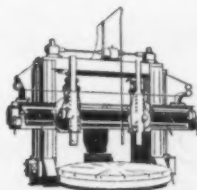
SHOVELS—Capacities from $\frac{1}{4}$ -yd. to 6-yd. Design features increase output.



DRAGLINES—Available in variable capacities for economical earth-moving performance.



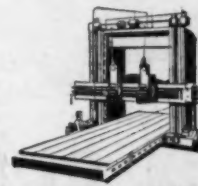
DIESEL ENGINES—For stationary and marine applications.



BORING MILLS—100" to 43' swing, with mechanical, electronic or hydraulic controls.



HEAVY DUTY LATHES—Line includes 40" to 168" engine lathes; or larger.



PLANERS—Standard models from 84" to 15'. Latest controls, every modern feature.

Baldwin-Lima-Hamilton Corporation, Philadelphia 42, Pennsylvania. **Plants:** Eddystone and Burnham, Pa.; Lima, Hamilton and Middletown, Ohio; Rochelle, Illinois; Greenwich, Connecticut; San Francisco, California. **Offices:** Chicago, Cleveland, Houston, New York, Philadelphia, Pittsburgh, San Francisco, St. Louis, Washington

LIMA - HAMILTON

5 Reasons why ONE Grating is Superior

1 Rigid one-piece construction . . . easy to install.

2 Maximum open area for light and air.

3 Easy to paint . . . all surfaces accessible.

4 Non-slip Twisted Cross-Bar.

5 Self-cleaning . . . no sharp corners to clog.

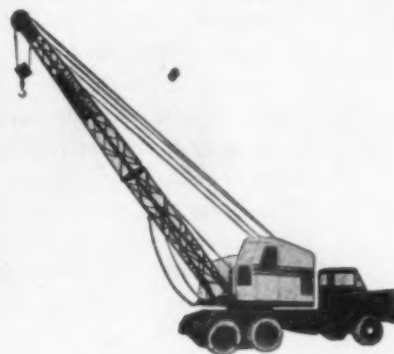
BLAW-KNOX *Electroforged* STEEL GRATING

BLAW-KNOX DIVISION OF BLAW-KNOX COMPANY
2075 Farmers Bank Bldg., Pittsburgh 22, Pa.
Offices in Principal Cities

WRITE FOR BULLETIN 2365

TRUCK-MOUNTED INDUSTRIAL YARD CRANE

A new 12½ ton truck-mounted industrial yard crane is announced by the Wayne Crane Division of the American Steel Dredge Co., Fort Wayne, Ind. Known as the Model 40, it has a swing speed of 6.4 rpm, travels at truck speeds, and converts easily to all crane and shovel attachments. Equalizing beam-type suspension and a locking third differential make possible heavy, off-the-road work. The Model 40 lifts, booms



and swings either simultaneously or independently. Standard power unit is a six-cylinder gasoline engine which develops 105 hp at 3200 rpm. The upper works of the new machine are enclosed in a weatherproof, inside bolted cab which permits inside access to all deck machinery. Job data and other details will be furnished on request.

HAVE YOU A STACK THAT NEEDS REPAINTING?

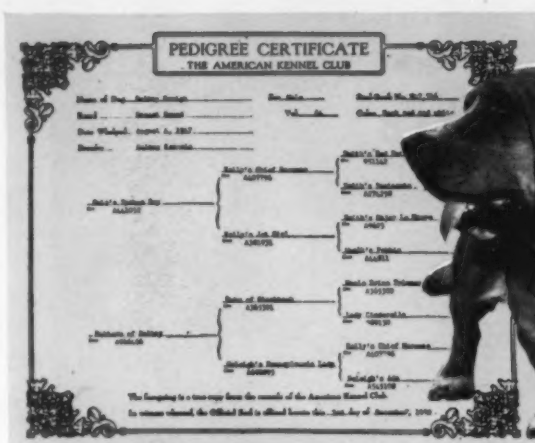
How to repaint a 150-foot stack with a minimum interruption in plant operation was demonstrated recently with the aid of a helicopter at the Monsanto Chemical Company plant in Everett, Mass.

The helicopter was the solution to the problem facing Russell L. Miller, plant manager, when he decided to paint the tall, pencil-like stack. By calling on the aircraft, Mr. Miller was able to avoid a day-and-a-half delay in painting operations—the time generally consumed in erecting scaffolding.

He did it this way. Steeplejack George F. Burgess of the Thomas J. Hind Company, Boston contractors, took off in the helicopter to the top of the stack. He took with him his staging hook, block and falls, and other equipment. While the pilot held the helicopter steady, Burgess simply leaned out the door and dropped his staging hook to the top of the stack. He then leisurely played out block and falls into the correct position. The helicopter descended to the plant and the steeple jack hopped out. He went to the base of the stack, slipped into the bos'n's chair attached to the rigging and went to work.

Total time, including take-off and landing: one half hour.

(Please turn to page 240)



THE BASSET HOUND, a hunting dog, is famous for his keenness of scent. The ears are long enough to fold over the tip of the nose and heavy dewlaps hang from a short powerful neck. The short legs are capable of tireless action.

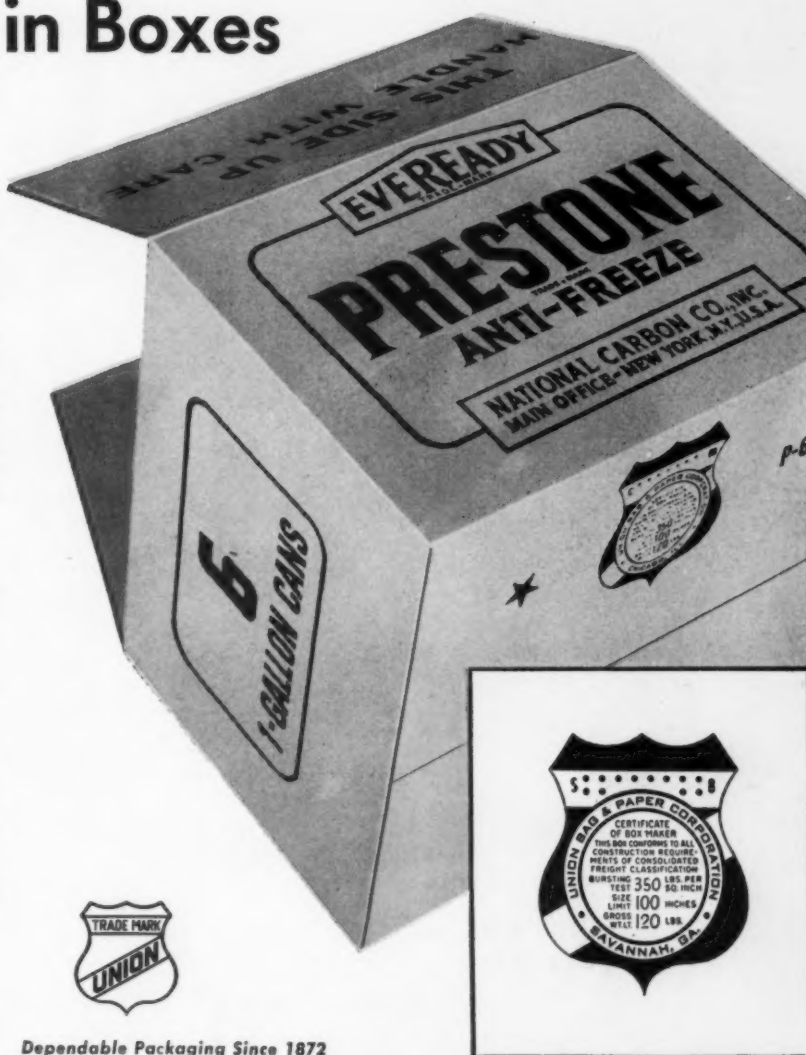
"Pedigree" is a Fancy Name for "Quality" ... in Bassets or in Boxes

AND in both cases, it's earned by knowing and controlling every step in development, right up to the finished article.

UNION traces the ancestry of its corrugated containers all the way back to Union-owned forests . . . controlled through every step of manufacture in Union mills (largest in the world) and right up to the shipping of Union boxes to your plant.

That earns a pedigree for Union boxes, because you *know* you can depend on every shipment being up to the same high standards. You can reduce breakage, pilferage, returns.

Union Carbide and Carbon agrees, and ships its nationally known Prestone Anti-Freeze all over America in Union's *pedigreed* boxes—just as hundreds of other famous firms do.



Dependable Packaging Since 1872

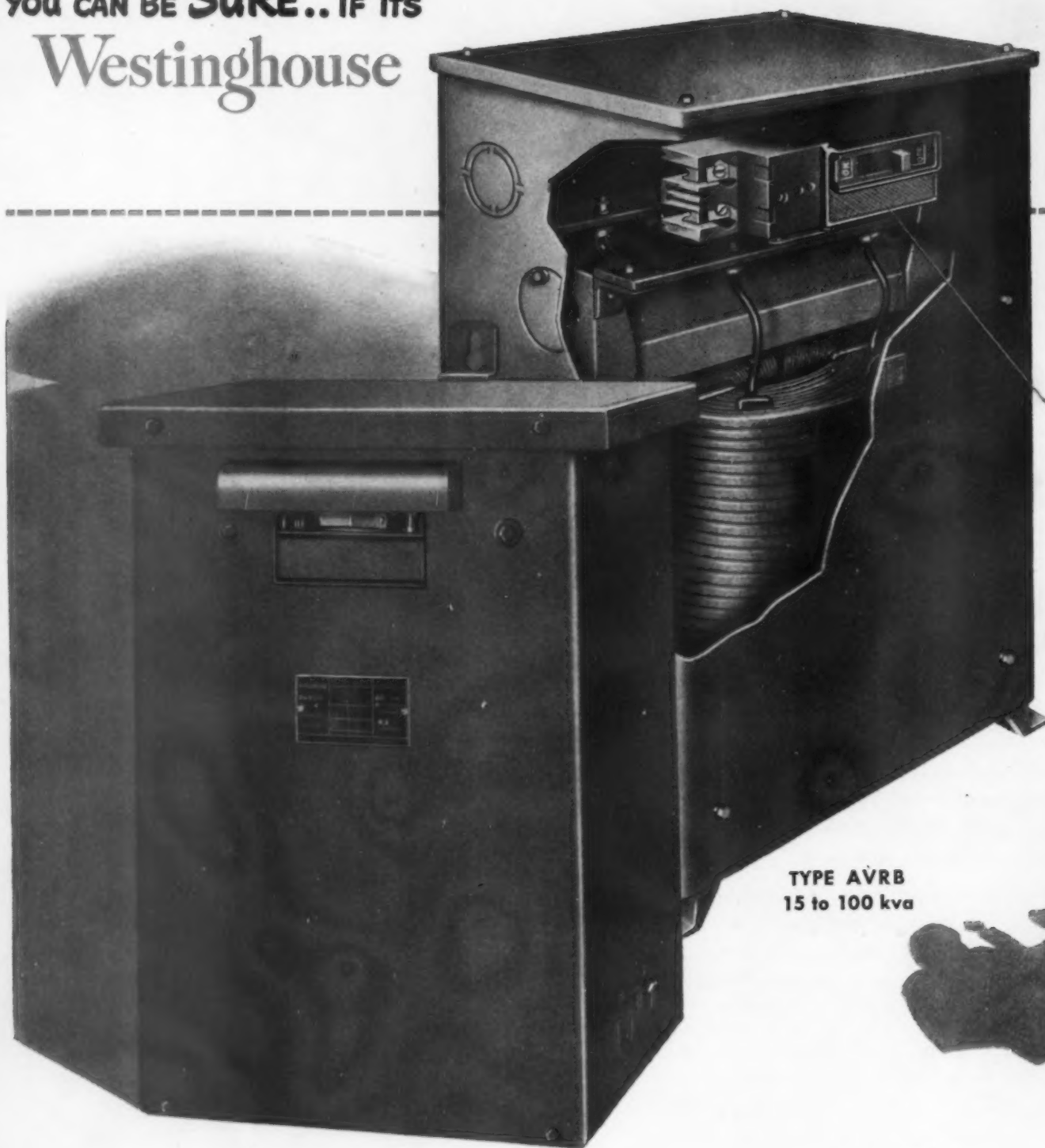
UNION Corrugated Containers

UNION BAG & Paper Corporation

Principal Offices: WOOLWORTH BLDG., NEW YORK 7, N. Y.

Corrugated Container Plants: SAVANNAH, GEORGIA • CHICAGO, ILLINOIS • TRENTON, NEW JERSEY

YOU CAN BE **SURE**.. IF IT'S
Westinghouse



TYPE AJRB
3 to 10 kva

TYPE AVRB
15 to 100 kva

Here's some information
you'll find useful when
purchasing electrical
products and services.

J.D.

TRIPLE

Protection against Overloads

Trouble caused by short circuits or by transformer overloads is stopped before it starts when you use Westinghouse Dry-Type Transformers with built-in circuit breakers. The breakers are connected in the high-voltage circuit, and are actuated by either (1) the coil-load current, (2) the temperature of the air within the transformer or (3) by both. This triple action provides *complete protection . . . sure safety* for circuits if trouble occurs. Furthermore, the co-ordinated time lag of the breaker permits carrying nondamaging, short-time overloads without service interruption.

You can get quick, economical correction of overloaded circuits with Westinghouse Dry-Type Transformers that have breaker performance like this . . . plus these additional features:

LOW INSTALLATION COST: Connect direct to wiring or raceways. Because you can install dry-type transformers close to the load, long runs of low-voltage lines can be eliminated.

EASY MOUNTING: Mount them wherever power is needed—on the floor, walls, columns, platforms, or overhead.

LOW MAINTENANCE COST: Dry-type construction is recognized as the "minimum maintenance" transformer design.

Save on power costs—run *your* distribution voltage close to the load with Westinghouse Dry-Type Transformers. Available in hv ratings of 600, 480 and 240. 100 kva and below, single phase. Ask your Westinghouse representative for Booklet B-4439, or write Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania.

J-92001

Westinghouse

DRY-TYPE TRANSFORMERS



Studying over springs



We can help!



Our specialists can help with your design and experimental work . . . make a few springs for tryout. Then we'll produce your perfect springs on fast, automatic equipment for low cost, volume production. Specifications already established? Then we'll make them for you economically, dependably — to exact specifications. Your inquiries invited.



Telephone Berkshire 7-6464
2100 N. Major Ave., Chicago 39, Ill.

BAKER ANNOUNCES NEW LINE OF FORK TRUCKS

New line of fork trucks known as the Type FC Center-control Fork Trucks, designed for maneuverability and utility in the handling of 3000 to 6000 pound loads, is announced by the Baker Industrial Truck Division of The Baker-Raulang Co., 1250 West 80th Street, Cleveland, Ohio. The new trucks find application where ruggedness and low maintenance are of particular importance and where stand-up drive is preferred. There are three types, the FC-30, 3000 lbs., 48" long, the FC-40, 4000 lbs., 48" long, and the FC-60, 6000 lbs., 48" long. The overall height is 83", telescoping lift 126", initial lift 63 1/4" for the FC-30 and FC-40 and 61" for the FC-60. Fork length is 36", outside spread 32". Wheelbase for the FC-30 and FC-40 is 43", and 48" for the FC-60; width over drive wheels is 35 1/4", 37 1/4" and 39 1/4" respectively.

When driving, the operator stands on the right side of the vehicle and due to the low-panel has an unobstructed view of the ends of the forks when engaging the load. The upright and hoist construction is such that there are no chains in the operator's line of vision with the load in the normal traveling position. Ease and simplicity of operation are provided in one pedal which controls power and braking. Because of accessibility and functional engineering, the FC trucks can be serviced quickly. According to the Baker company, power axle can be removed in 60 minutes, trailing axle in 20 minutes, and brakes can be relined in 30 minutes. Full information about the new line will be furnished upon request.

MANUAL OF PRACTICAL OXYGEN CUTTING TECHNIQUES

The widescale use of oxygen cutting in the production effort of World War II firmly established this process as the standard industrial method for shaping ferrous metal parts for fabrication. With production of armaments and other equipment again a prime industrial objective, the publication of Slottman and Roper's book, "Oxygen Cutting," is of particular interest.

Released in January by the McGraw Hill Book Company, this book provides the metal working industry with a comprehensive and authoritative manual of practical oxygen cutting techniques, as well as a summary of our present-day knowledge of the subject. In addition to fundamental information on the action of the cutting jet and the mechanism of the process, the book includes extensive discussions of the many uses to which oxygen cutting may be applied, and presents interesting historical background material.

Special chapters are devoted to the effects of oxygen purity, metal temperature, and alloying elements on the cutting action; the effects of oxygen cutting on ferrous alloys; plant facilities; oxygen cutting equipment; the operation and use (Please turn to page 242)



**Making Fast,
but**

FAST!

In many cases, the secret of economical—and profitable—fastening operations in production is *speed*, both in getting parts together properly and cutting costly fumbling with defective fasteners.

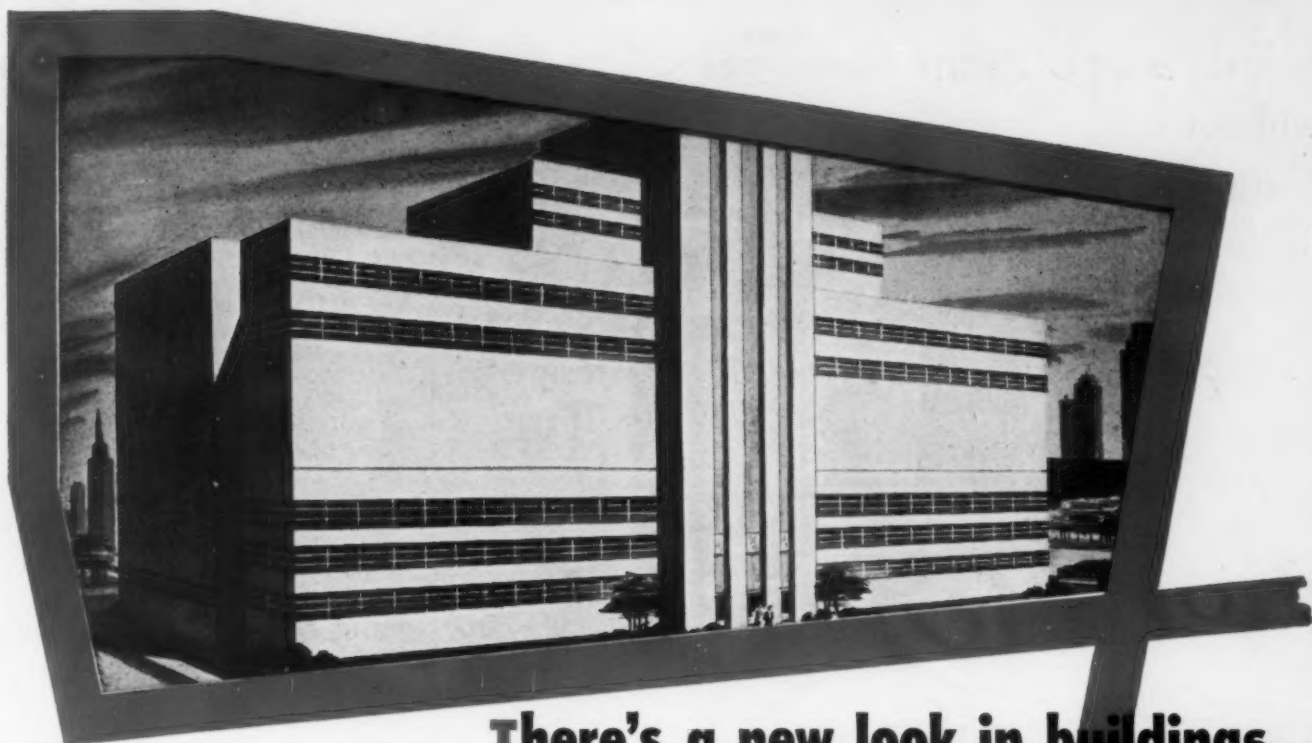
Naturally, fastener quality is an important key to high-speed assembly. A *good* fastener—uniform dimensionally and right for the job—can save its price many times over.

Scovill makes good fasteners

Scovill fasteners are made on special order only; no "bin" stock is carried. They are "custom-made" for each job.



Montclair, N. J. • Detroit • Wheaton, Ill.
Los Angeles • Cleveland • San Francisco



**There's a new look in buildings...
but the name on the pipe is the same...**

SPANG CW

Radiant heating is the new look in heating for today's modern office, factory buildings and homes . . . and Spang CW Steel Pipe is your best buy for trouble-free radiant heating in all kinds of structures.

Your men will like the way Spang CW Steel Pipe fits up. It's uniformly top-quality, it bends smoothly and easily, is easy to cut and weld.

Spang CW Steel Pipe gives years of trouble-free service in modern closed-circuit heating systems. It's been a standard piping material ever since closed wet heating was developed, and it is used throughout industry for all kinds of services.

Spang CW Steel Pipe is distributed by leading supply houses everywhere. They handle the things you'll need to go with Spang CW Steel Pipe for radiant heating, snow-melting, and any other wet-type heating system. Tell them what you need . . . in spite of today's great demand for Spang CW Steel Pipe, they'll do everything possible to make deliveries quickly, fairly.

SPANG-CHALFANT

Division of The National Supply Company

GENERAL SALES OFFICE: Grant Bldg., Pittsburgh, Pa.

District Sales Offices: Atlanta; Boston; Detroit; Houston; Los Angeles; New York; Philadelphia; Pittsburgh; St. Louis

**SPANG
CW**

STEEL PIPE

QUALITY

*that is
recognized
wherever pipe
is used*



picture of a Plant Manager
without a
wiper worry
in the world



**HE USES KEX
INDUSTRIAL WIPING TOWELS!**

No frantic telephone calls during the day trying to find wiping material for him. No loss of sleep at night worrying about it.

He has KEX®—a steady, reliable source of high quality industrial wiping towels coming into his plant regularly, neatly bundled, and in just the quantity he needs.

Lucky? Not a bit—he's just smart!

He decided no makeshift Wipers for *his* plant! He wanted to save time, money and worry by having the best. So he discovered that KEX towels are super-absorbent, softer, uniform in size, hygienically clean and made for orderly shop housekeeping. He also went for the fact that a percentage of KEX towels is printed with safety slogans.

So if wiping problems are giving you headaches—and sleepless nights—look up the KEX distributor in your classified telephone book. There's nothing to buy, just a low rental service per month. Better do it right away, though. Everybody's getting the KEX idea.



**"KEX" NATIONAL
SERVICE**
* REG. U.S. PAT. OFF. 295 Fifth Ave., New York 16, N. Y.

(Continued from page 240)

of the oxygen lance; hand and machine cutting; electronic tracing devices; multiple and stack cutting; and underwater cutting, to mention several.

George V. Slottman, Director of Research and Engineering, Air Reduction Company, Inc., has been directly associated with the development of oxygen cutting processes since 1934. He was formerly Professor of Chemical Engineering, Massachusetts Institute of Technology.

Edward H. Roper is Assistant Technical Sales Manager of the Air Reduction Sales Company, a division of the Air Reduction Co. He has a broad background of engineering experience in the field.

"Oxygen Cutting" is priced at \$6.50. For further information contact McGraw-Hill Book Information Service, 327 W. 41st Street, New York 18, N. Y.

**VALUE OF TESTING LABORATORY
IN PUBLIC PURCHASING**

The problem of a large governmental purchasing organization in getting the greatest value for its purchase dollar can be minimized to a great extent by having at its disposal a competently staffed and equipped testing laboratory, declared H. A. McArdle, Chief of Purchase, New York City Housing Authority, at the recent annual meeting of the National Institute of Governmental Purchasing, in Milwaukee.

"Purchase specifications and standards alone will not guarantee compliance with the quality and performance desired," he continued. "The pressure of the system of competitive bidding under which we operate is constantly tending to lower quality and performance. The determination of standards of performance and the writing of specifications to set forth those standards, acts as an antidote to the lowering of quality. Equally important is a systematic method of sampling and testing to determine compliance with the standards set.

"The City of New York is fortunate in possessing a well equipped Central Testing Laboratory, under the jurisdiction of Commissioner of Purchase, John Splain. A staff of 22 chemists, and other supporting personnel, is engaged in testing the wide variety of materials from castings to bed sheets, that are used by a large municipality. Samples of purchased materials are taken at various delivery points throughout the city by inspectors attached to the Controller's staff, and forwarded to the laboratory for testing. Other agencies, including the Board of Education and the Housing Authority, who maintain their own purchasing and inspection staffs, have the privilege of having their materials tested by the Department of Purchase laboratory."

Mr. McArdle stated that coal is one of the commodities that require constant sampling and testing to determine compliance with quality standards, explaining that truck deliveries are necessary for the greatest proportion of tonnage

(Please turn to page 244)



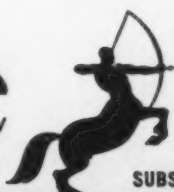
**THE RIGHT PLACE FOR
COPPER AND BRASS**
For all Defense Orders

If you require copper or brass for defense orders (DO), get in touch with your nearest Chase warehouse. Right now both mill and warehouse deliveries are good. And on "DO" orders, small quantities can often be delivered immediately from our warehouse stocks.

With the largest chain of brass and copper warehouses in the world, and with eastern and midwestern mills, no one is in a position to give you better service on your brass and copper orders for defense. So when you think of brass call one of our 27 branch offices (23 of them warehouses) listed below.

ROTATING BANDS. We are set up to supply copper and gilding metal rotating bands in all sizes, concentric, clean and properly annealed for trouble-free banding. Send us your inquiries.

Chase



the Nation's Headquarters for
BRASS & COPPER

WATERBURY 20 CONNECTICUT

SUBSIDIARY OF KENNECOTT COPPER CORPORATION

THIS IS THE CHASE NETWORK . . . handiest way to buy brass

ALBANY! ATLANTA BALTIMORE BOSTON CHICAGO CINCINNATI CLEVELAND DALLAS DENVER! DETROIT HOUSTON! INDIANAPOLIS KANSAS CITY, MO. LOS ANGELES MILWAUKEE
MINNEAPOLIS NEWARK NEW ORLEANS NEW YORK PHILADELPHIA PITTSBURGH PROVIDENCE ROCHESTER! ST. LOUIS SAN FRANCISCO SEATTLE WATERBURY (Sales Office Only)

Bendix-Skinner

ORIGINATOR OF MICRONIC FILTRATION

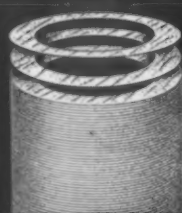
the *Finest*

**Answer to Any
Filtering Problem**



For over twenty years **Bendix-Skinner** has specialized in solving the filtering problems that "couldn't be done." From this experience has come entirely new and exclusive filtering techniques which do even the work-a-day filtering jobs better and at lower long-range cost. Tell us about your problem—nine times out of ten **Bendix-Skinner** filters will supply the "finest" answer.

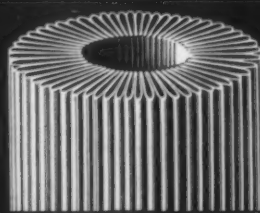
Over 350 Models providing filtration from $\frac{1}{2}$ micron (.000019") upwards at flow rates from 1 to 5000 g.p.m.



Disc-type



Ribbon-type



Pleated-type

SKINNER PURIFIERS DIVISION OF

1501 TROMBLY AVENUE, DETROIT 11, MICHIGAN

Export Sales: Bendix International Division, 72 Fifth Ave., N. Y. 11, N. Y.



(Continued from page 242)

due to location of consuming points. A representative sample is taken from each truckload. In order to maintain credit standing and realize on the cash discount, the contract provides for payment of 95% of the amount due pending laboratory tests, and any adjustments are taken care of when the 5% balance is paid. The coal contracts provide a scale of deductions, to which the supplier consents, for variations from specifications requirement. These deductions are applied for excess moisture, excess ash, BTU deficiency, fixed carbon below minimum, excess undersized coal, or excess amount of dirt and dust. The percentage of deduction increases with the amount of variation so that there is a strong deterrent to delivery of sub-standard fuel. Mr. McArdle stated that the records of the Board of Education indicate that penalties were deducted on about 20% of coal deliveries to the schools during last year, and that the incidence of variations from specification requirements justifies the continued sampling and testing of coal.

"This does not apply to all bulk commodities," he said. "Our experience with the testing of heavy grades of fuel oil is quite different than with coal. The record indicates that of 190 samples of #6 fuel oil tested, only one was below specification standards sufficient to warrant a penalty. This indicates compliance of over 99%, and leads to the conclusion that less sampling and testing is necessary. The same conclusion may be reached on gasoline, as consistent quality is apparently being maintained by the suppliers.

"Testing to determine compliance with specification requirements is an essential for any large purchasing organization that is committed to the principle of competitive bidding. A testing laboratory is a valuable adjunct to standards and specification research and a means of getting more value for the tax dollar."

1 1 1

WESTERN PINE ISSUES FOLDER ON TERMS AND WEIGHTS

The Western Pine Association, recently announced publication of a folder entitled "Western Pine Terms and Conditions of Quotation and Sale and Schedule of Estimated Weights."

It marks the first time the association has published the information in separate form.

"Although these terms and weights may be used by any shipper who elects to do so," S. V. Fullaway, Jr., secretary-manager, said, "their use or modification is strictly a matter of individual choice. The association will not urge or promote their use except by distribution of copies free upon request."

The terms and weights are printed in a four-page 8 $\frac{1}{2}$ x11" folder, punched for insertion in a three-ring binder. Requests should be addressed to Dept. TW, Western Pine Association, Yeon Building, Portland 4, Ore.

(Please turn to page 248)

HOLES PER GRIND

*increased
from
8 to 83!*

The Right CLE-FORGE stock drill
gives spectacular performance

A farm implement manufacturer had trouble drilling small, deep holes in a 1019 steel shaft. Regular drills burned on the corners and gave only 3 to 8 holes per grind. ♦ When a *Cleveland* Service Representative was called in, he recommended the special purpose CLE-FORGE High Speed Drill, a stock item, illustrated here. Speed and feed remained the same. The CLE-FORGE High Speed Drills averages *ten times more holes per grind!* ♦ There are several special purpose CLE-FORGE High Speed Drills, regularly stocked by your Distributor, which often can help you solve a difficult drilling problem. A *Cleveland* Service Representative will be glad to advise you. Contact our nearest Stockroom, or . . .

Telephone Your Industrial Supply Distributor

1876 1951



THE MARK OF QUALITY
FOR 75 YEARS

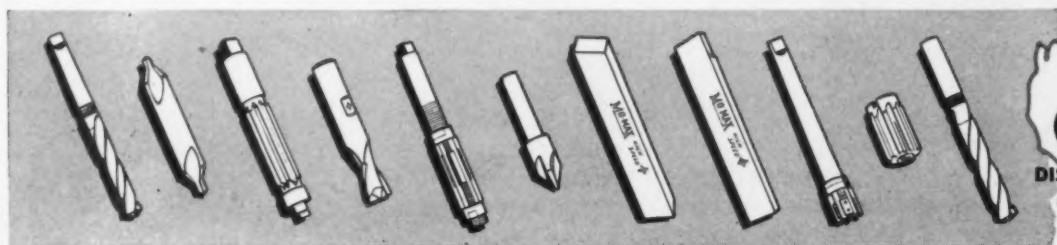
THE CLEVELAND TWIST DRILL CO.

1242 East 49th Street

Cleveland 14, Ohio

Stockrooms: New York 7 • Detroit 2 • Chicago 6 • Dallas 1 • San Francisco 5 • Los Angeles 58

E. P. Barrus, Ltd., London W. 3, England



ASK YOUR INDUSTRIAL SUPPLY DISTRIBUTOR FOR THESE AND OTHER *Cleveland* TOOLS

MARCH, 1951

Want Additional Product Information? See Page 19.

245

for DC Heliwelding



Your
best bet
is

AIRCO THOR-TUNG ELECTRODES

Here's a tungsten electrode that's especially designed for all positions on straight polarity, DC Heliwelding on stainless steel, copper, mild steel and aluminum, using Heliwelding, Airco's inert gas arc welding process. Made with thoriated tungsten, long-noted for its excellent electron emission characteristics, Airco Thor-Tung offers these advantages —

IT DOESN'T MELT . . .

Airco Thor-Tung does not "ball up" at the end of the electrode nor does it sputter off into the puddle when subjected to high arc welding temperatures — because of its cool operating characteristics, longer life is obtained from each electrode.

NO CONTAMINATION . . .

Airco Thor-Tung permits the operator to "touch-start" directly on the work without contaminating the work or the electrode. Uncontaminated

electrodes increase production and result in better welds.

EXCELLENT ARC STABILITY . . .

One of the keys to consistent weld quality and ease of operation is good arc stability. With Airco Thor-Tung, the arc is very stable and does not wander or climb up the electrode even at low currents. Touch starting is made easy even with currents as low as 15 Amperes. The better stability of these electrodes enables a given size to be used over a wider range of currents.

ECONOMICAL . . .

Thor-Tung's permanency, ease of operation and stability make it the most economical electrode for straight polarity, DC Heliwelding.

For full information about Airco Thor-Tung, write your nearby Airco office today.



AIR REDUCTION

AIR REDUCTION SALES COMPANY • AIR REDUCTION MAGNOLIA COMPANY

AIR REDUCTION PACIFIC COMPANY

REPRESENTED INTERNATIONALLY BY AIRCO COMPANY INTERNATIONAL

Divisions of Air Reduction Company, Incorporated

Offices in Principal Cities

Yours for the asking—

Taylor Forge Welding Fittings Data Sheet

This sheet provides data for seamless welding fittings, including dimensions for various nominal pipe sizes (1/2" to 30") and wall thicknesses. It includes tables for standard, long, and short radius fittings, as well as a section for flange dimensions (A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z).

ON THIS SIDE
Data on the WeldELL line

Taylor Forge ASA Forged Steel Flanges Data Sheet

This sheet provides data for ASA forged steel flanges, including dimensions for various nominal pipe sizes (1/2" to 30") and weights (150 lb, 300 lb, 600 lb, 900 lb, 1500 lb). It includes tables for standard, long, and short radius flanges, as well as a section for flange dimensions (A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z).

ON THIS SIDE
Data on
Taylor Forged Steel Flanges

A VOLUME OF DATA

... covering welding fittings and forged steel flanges ...

ON A SINGLE SHEET

Here is just about the handiest tool ever devised for the pipe designer. Data on welding fittings and flanges that otherwise could be found only by plowing through many catalog pages and tables have been ingeniously condensed on the two sides of the durable letter-size card illustrated above.

One side covers the broad WeldELL line of Taylor Forge welding fittings. For every nominal pipe size, 1/2" through 30", it shows the wall thickness for every weight of every fitting in every available material. It also shows all required dimensions of all types of fittings.

The other side covers the world's most complete line of forged steel flanges. For every nominal pipe size, 1/2"

through 24", it gives all essential dimensional and bolting data for all types of flanges in all weights. A particularly useful table (see reproduction) is that showing welding neck flange bores which enables you to determine the I.D. of any nominal pipe size without separate calculation. Thus the sheet gives you O.D. and I.D. of any weight of pipe.

The card is varnished to make it stand the steady usage you are certain to give it. To obtain your copy see your Taylor Forge distributor or

MAIL THE COUPON.



TAYLOR FORGE

TAYLOR FORGE & PIPE WORKS

General Offices and Works: P. O. Box 485, Chicago 90, Ill.

Offices in all principal cities.

Plants at: Carnegie, Pa.; Fontana, Calif.; Hamilton, Ont., Canada

Please send me one of your fitting and flange sheets:

NAME _____

POSITION _____

COMPANY _____

STREET ADDRESS _____

CITY _____ ZONE _____ STATE _____

517-0351 Mail to Taylor Forge & Pipe Works, P. O. Box 485, Chicago 90, Ill.

PACKAGED BRASS AND STEEL SHIM STOCK

Ready for instant use without fumbling or waste

Packaged shim stock means *convenience*! No clumsy handling or spoilage of large bulky sheets or rolls. In our dispensing cartons and packets the stock is always protected, yet always available for immediate use. Just pull the length you need out of the carton slot—and snip it off. Saves time, saves space!

There's a handy carton, packet or rack designed for your requirements by the makers of the famous LAMINUM Shims



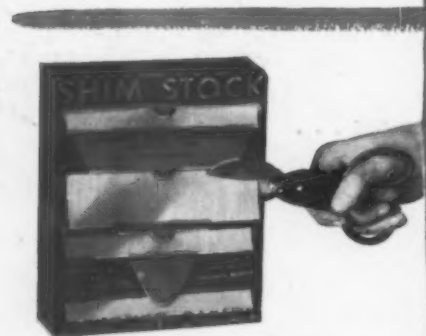
RUGGED CARTON DISPENSERS

6 x 100 inch rolls in metal-edged cartons. Stock feeds through carton slot, as required. No re-rolling, no ruined stock. Available in 11 gauges: .001, .0015, .002, .003, .004, .005, .006, .007, .008, .009 and .010 inch.



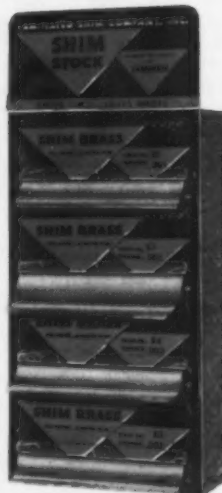
STURDY FLAT PACKETS

Two 6 x 25 inch sheets to the envelope. The heavier gauges—which do not roll easily—are supplied in special protecting flat packets: .012, .015, .020, .025 and .032 inch.



THE METAL DISPENSING RACK

Holds the four gauges of your choice. Pick the four gauges you use the most. Rack is designed to hold the 6 x 100 inch carton dispensers. Sets on bench or hangs on wall.



THE 4-GAUGE ECONOMY CARTON

Four 6 x 50 inch rolls in one carton. The utility unit, containing the four most popular gauges: .001, .002, .003 and .005 inch. The same first quality brass or steel shim stock.

Check with your industrial distributor!

LAMINATED SHIM COMPANY, Inc.

2403 UNION STREET

GLENBROOK, CONN.

SHIM STOCK



STAMPINGS CUSTOM SHIMS AN-COR-LOX NUTS

SMART CHAPEAU FOR WOMEN INDUSTRIAL WORKERS

Here's a new hat for women industrial workers that hasn't overlooked a point in the way of safety, known as the "Ray-ve", introduced by the Safety Division of The Boyer Campbell Co., 6540 St. Antoine Street, Detroit 2, Mich. The hat is made of washable blue taffeta, featherweight and cool. It is said to ob-



A smart, practical safety hat for women.

violate scalp perspiration. The design and construction of the hat are such that there is no inclination to tuft the hair in front, a hazardous practice with a peak cap which is worn on the back of the head. The snood is adjustable to take care of any amount of hair.

1 1 1

GOVERNMENTAL PURCHASING RUNNING INTO DIFFICULTIES

The District of Columbia is having difficulty in obtaining certain materials for operation, maintenance and repair needs of District Departments, stated Purchasing Officer Roland M. Brennan, Washington, D. C., in recent report to the Commissioners, Budget Officers and Heads of Departments. "It was only after several months' search that we succeeded in locating a vendor who can furnish 12,000 pounds of 10 gauge steel sheets for the repair of garbage truck bodies and for other essential purposes in the Department of Sanitation.

"A number of vendors", his report continues, "are insisting upon the District furnishing a "DO" priority rating, which, of course, the District has no authority to apply on its purchase orders. As a result of this, it has been necessary, in some cases, in order to fill our needs, to make awards to bidders quoting higher prices because those vendors did not insist upon receiving rated orders.

"Any sharp increase in spending for defense will necessarily affect the ability to obtain critical materials for maintenance, repair and operating needs of District department, unless priority assistance is granted by the National Production Authority to States, Counties and Cities as was done during the last war. Shortages and delayed deliveries are plaguing us now.

"One authority has stated that controls will be with us for an indefinite

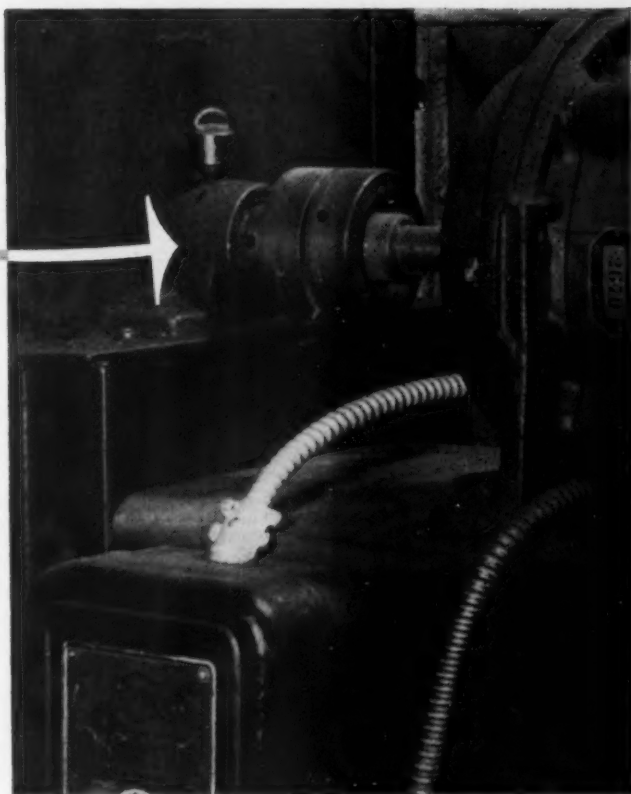
(Please turn to page 250)

FOR **21** YEARS...this money-saving idea has been right "on the ball"

In 1929, the Heat Diffusing Unit (illustrated), equipped with two Fafnir SA $\frac{3}{4}$ " Pillow Blocks, was installed. For over 20 years, this machine has been operating without the least sign of bearing trouble. The unit runs at 1750 RPM and is grease lubricated . . . no regular grease lubrication cycle. Notice the dirt accumulated around the block and the absence of grease leakage.

Here's a bearing application that may give you an idea on how to whittle down costs. Through a simple shift from old-fashioned bearings to ball bearings, the heat diffuser shown above has been free from any bearing troubles . . . maintenance cut to almost nothing . . . no lubricant leakage.

Fafnir "packaged" ball bearings make such changeovers simple . . . on power transmission equipment, line shafting, blowers and fans, conveyors etc. No special housings or lubricating systems to design. Installation is done in 3 quick steps. No shaft shouldering and none of the complexities of lock-nuts, washers, sleeves or adapters are involved because Fafnir units have the famous



Wide Inner Ring bearings with self-locking collars. Actual installation records show that Fafnir units often pay for themselves in less than a year. Your Fafnir distributor has the facts. Why not check with him? The Fafnir Bearing Company, New Britain, Conn.

PILLOW BLOCKS



... all types . . .
light, standard,
heavy . . . fixed
and floating.

CARTRIDGES



... light and
heavy series.

FLANGETTES



... with pressed
steel flanges.

FAFNIR

BALL BEARINGS

MOST COMPLETE



LINE IN AMERICA

IT'S TIME TO CHECK SOURCES OF SUPPLY!

Do you have literature and prices on these **Harrisburg** products? If not, write for them right now.



HARRISBURG seamless steel cylinders for storage and transportation of high-pressure gases and liquids.



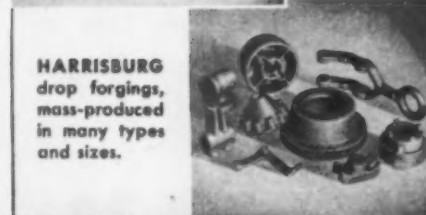
HARRISBURG lite-weight alloy cylinders for the liquefied petroleum gas industry.



HARRISBURG seamless steel pipe couplings made to A.P.I. and A. I. S. I. specifications.



HARRISBURG drop-forged steel pipe flanges made to A. S. A. standards.



HARRISBURG drop forgings, mass-produced in many types and sizes.

Harrisburg
STEEL CORPORATION
Harrisburg 19, Penna.

98 YEARS IN PENNSYLVANIA'S CAPITAL
Custom-Built Quality Products in Quantity

Continued from page 248)
period, and will not be lifted even after the National Emergency is over, as was the case after World War II. Another authority predicts that the purchasing power of the dollar will decline further. According to the Irving Fisher Index of Wholesale Commodity Prices, the purchasing power of the dollar, on a 1926 basis, was 53.97 on December 28, 1950, the lowest recorded.

"According to the Bureau of Labor Statistics, Department of Labor, the total Cost of Living Index as of November 1950, reached 175.6, the highest in recent history. Food, clothing, rent, gas and electricity, other fuels and ice, house furnishings and miscellaneous, make up this index. That food prices are excessive is corroborated by the Dun and Bradstreet Wholesale Food Price Index of December 1950, which gave the total cost of one pound each of 31 various types of food at \$6.81 as the average for the month of December 1950, which almost reached the peak set September 1, 1948, when it was \$6.95. Compared with December 1949, the increase in one year is approximately \$1.10."

1 1 1

BOOKLET PRESENTS CASE HISTORIES OF UNUSUAL PLANT ECONOMIES

A number of selected case histories in efficiency and economy are presented in a 40-page booklet—"Modern Techniques in Aircraft Manufacturing"—recently issued by The Glenn L. Martin Company, Baltimore. Containing a total of seventeen articles, reprinted from THE MARTIN STAR, the brochure is being made available under the company's long-standing policy of sharing know-how freely with American industry—in behalf of the National Defense effort.

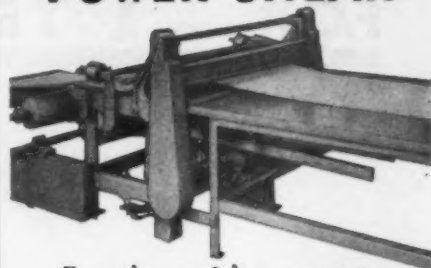
"There are three logical ways to effect savings," observes C. C. Pearson, President of the Martin Company, in the preface. "These are: (1) to avoid spending; (2) to spend wisely; and (3) to utilize to the utmost, what has been purchased. How all three are taken fully into account at the Martin plant", he points out, "will appear from even a cursory study of this booklet".

The articles cover such standard phases as budgetary and production schedule controls. They document the various working programs within the engineering, tooling and manufacturing departments, whereby economy measures are systematized and enforced.

Special articles outline the savings realized in factory maintenance and other plant operations in which reductions of overhead costs are being effected.

Specific topics are: budgetary system, facilities procurement controls, shop familiarization, design cost control, standard processing, tool planning, blueprint reproduction economies, low-cost lofting, tool manufacturing methods, production short cuts, worker participation, better machine shop practices, surplus and scrap salvage, in-plant transportation, money-saving maintenance, heating and air-conditioning economies and the Martin Control (Chart) Room.

THE *Jacques* SEMI-AUTOMATIC POWER SHEAR



For the quick, accurate cutting of materials from rolls or sheets with hand or electronic controls.

Write today for new descriptive folder showing features and applications.



HOBBS

MANUFACTURING CO.

10 Salisbury St., Worcester 5, Mass.

Manufacturers of:

JACQUES Hand and Power Shears, Slitters and Rewinders, **TRI-POWER** Die Presses, **HOBLOK** and **LOXIT** Cotter Pins, **TANGLEPROOF** Lock Washers.

GOVERNMENT CONTRACTORS



**SPARE
PARTS
BOXES**

CONFORMING TO

Federal Specifications. Military Specifications. Air Force — Navy Aeronautical Specifications. Navy Department Specifications.

WRITE FOR FURTHER
INFORMATION

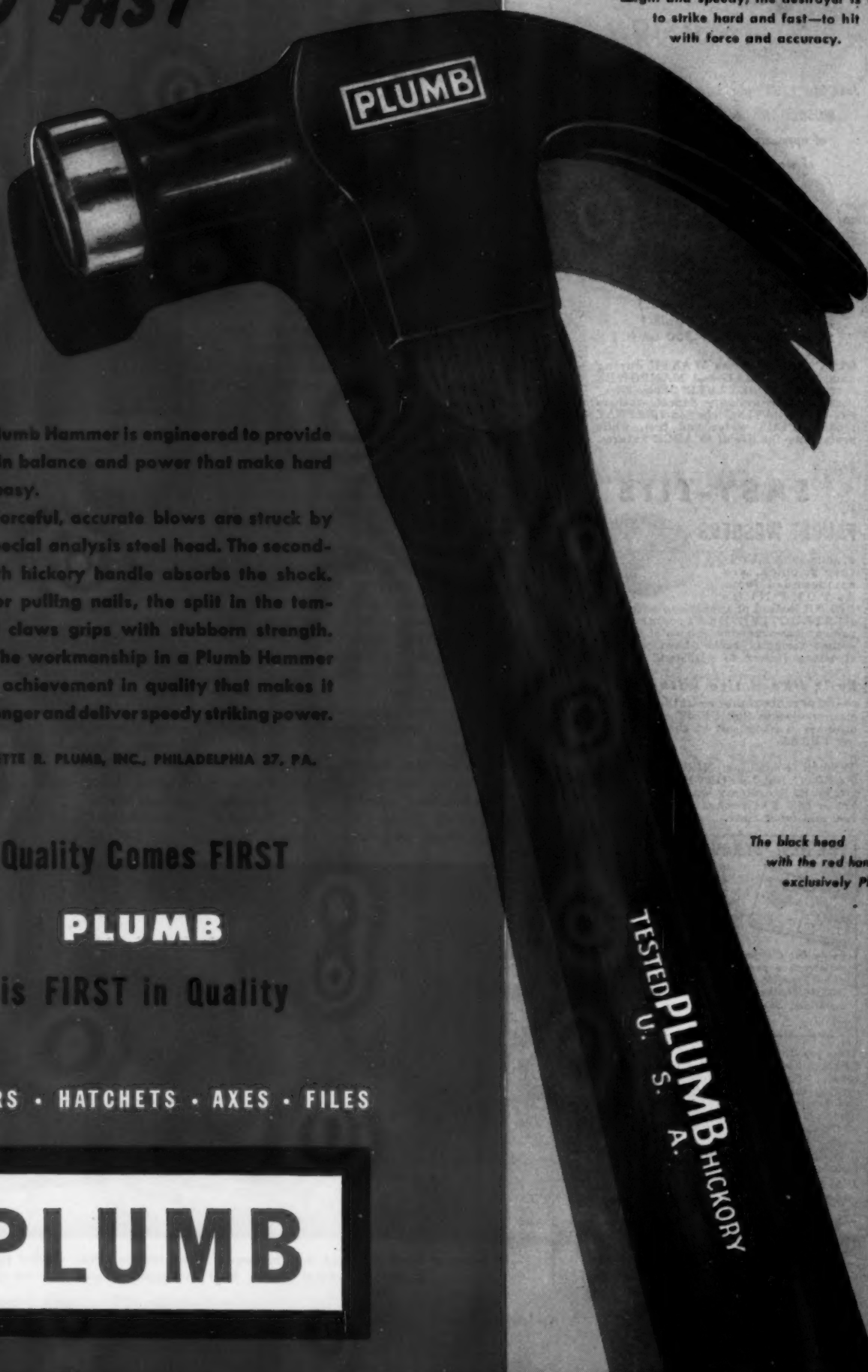


MANUFACTURING CO.
OWATONNA, 10, MINN.

STRIKES HARD AND FAST



Light and speedy, the destroyer is built to strike hard and fast—to hit with force and accuracy.



The Plumb Hammer is engineered to provide built-in balance and power that make hard jobs easy.

Forceful, accurate blows are struck by the special analysis steel head. The second-growth hickory handle absorbs the shock. Or, for pulling nails, the split in the tempered claws grips with stubborn strength.

The workmanship in a Plumb Hammer is an achievement in quality that makes it last longer and deliver speedy striking power.

FAYETTE R. PLUMB, INC., PHILADELPHIA 27, PA.

Quality Comes FIRST

PLUMB

is FIRST in Quality

HAMMERS • HATCHETS • AXES • FILES

PLUMB

The black head
with the red handle—
exclusively PLUMB

TESTED U.S.A.
PLUMB
HICKORY

**LIKE AN
ATOM-IC
EXPLOSION**

Just ONE 1/32" pin-hole size faucet LEAK
MUSHROOMS into ATOMIC WASTE
of approximately 76,000 gallons
of water yearly—COSTING:

\$1013
@ \$1 per M cubic feet

If a hot water faucet, then actual
FUEL WASTED heating 76,000 gallons
costs approximately:

\$27.65 if coal (7,900 lbs.)
\$38.00 if oil (633 gals.)
\$50.63 if gas (67,500 cu. ft.)

STOP this needless WASTE during
today's MATERIAL and MANPOWER
shortages with 'SEXAUER' "Easy-Tite"
that outwear ordinary faucet washers
6-to-1, thus SAVING labor on 5 REPEAT
repairs, PLUS water and fuel, while
prolonging the life of SCARCE fixtures.

PAT'D.

"EASY-TITE" FAUCET WASHERS

...a modern labora-
tory triumph, are
compounded from
du PONT NEO-
PRENE instead of rubber—to withstand
DESTRUCTIVE HEAT common in
present-day super-heating water systems
—that formerly broke down washer's
structure (tested to withstand 300°F.).

Built like a tire with fabric
re-inforcement they resist the grinding,
closing squeeze that SPLIT and MUSH
ordinary washers out of shape...caus-
ing LEAKS.

Through combining NEOPRENE and
FABRIC RE-INFORCEMENT they
OUTWEAR ordinary washers 6-to-1 on
hot or cold TAPS—thus you slash water
fuel and labor costs.

THE NEW 'SEXAUER' CATALOG



Edition F, just out
pictures over 2500
TRIPLE-WEAR plumbing
REPAIR parts and
Pat'd. Precision
Tools. It's today's
accepted buying
guide for discriminating purchasing and
maintenance personnel among thousands
of top PLANTS, INSTITUTIONS and GOVT.
AGENCIES that rely on SEXAUER repair
materials. Send for your copy today!

Then too, there's a SEXAUER TECHN-
ICIAN within quick call from coast-to-
coast, who offers a special SURVEY
service that sets up a schedule of the
exact replacement parts required for your
particular plumbing fixture regardless
of make or age and without obligation.

A postcard will bring him and your NEW
Catalog F promptly.

J. A. SEXAUER MFG. CO., INC., Dept. AP 31
2503-05 Third Avenue, New York 51.

SEXAUER
WORLD'S LEADING SPECIALISTS IN
PLUMBING AND HEATING REPAIR PARTS

as advertised in THE SATURDAY EVENING POST

New Refractory Withstands Temperatures Up to 4600°F

An important new refractory product,
Fused Stabilized Zirconia, was an-
nounced recently by Norton Company,
manufacturers of grinding wheels, grind-
ing machines, and refractory products,
Worcester, Mass.

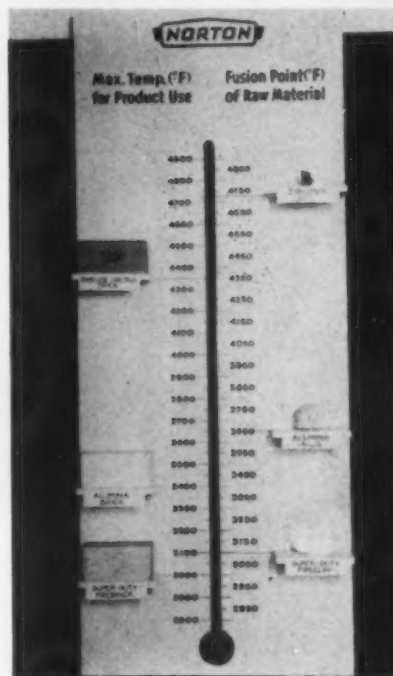
A product which promises to open an
entirely new era in chemical processing
at ultra-high temperatures, Norton
Fused Stabilized Zirconia in molded
shapes will withstand temperatures up to
4600 degrees Fahrenheit—far beyond the
limit of other commercial oxide refrac-
tories. (Fire clay up to 3000 degrees
Fahrenheit, Fused Alumina up to 3300
degrees Fahrenheit; pure oxide of mag-
nesia as made by Norton Company up
to 4000 degrees Fahrenheit.)

All the uses to which this product can
be put are not yet known. Those which
are include a variety of molded shapes
such as: furnace lining bricks for gas
synthesis at high temperatures in the
chemical industry; setter plates for firing
titanates used in the construction of
capacitors in the electronic equipment
field; heating elements for electric fur-
naces; containers and conveyers for
molten steel; thermal insulation (high
frequency induction or resistor wound
furnaces).

Fused Stabilized Zirconia is a paradox-
ical product. Unlike most materials, it is
a poor conductor of electricity at low
temperatures but an excellent electrical
conductor when subjected to high heat.
In spite of its high bulk density, it is a
low conductor of heat and, therefore, a
superior thermal insulating material.

For 40 years Norton Company has
been engineering special refractories for
industry capable of withstanding higher
temperatures. Fused Zirconia was first
made in Norton laboratories in 1946,
which, if now manufactured by the
process then used, would sell for about
\$2.00 a pound.

It was realized that for commercial use
such a price was far too high. Further
experimentation resulted in a process
for making Fused Stabilized Zirconia
directly from ores, which reduced con-

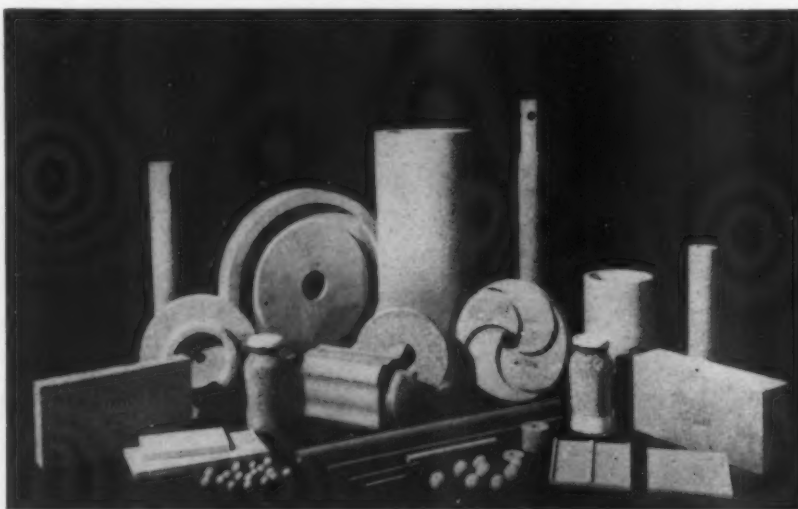


High temperature thermometer illus-
trating comparative temperatures at
which Norton refractories are used

sumer cost to an average of \$0.50 a
pound in grain form. Fired shapes are
priced appreciably higher. A patent cov-
ering the Norton process of manufactur-
ing Fused Stabilized Zirconia and also
covering the Fused Stabilized Zirconia
produced thereby and a brick or other
article made of this Fused Stabilized
Zirconia was granted to Norton Com-
pany on December 26, 1950.

Zirconia (zirconium oxide—ZrO₂)
comes from zircon found as a natural
mineral in Australian and Florida beach
sands. Zirconium is one of Nature's basic
elements. Another source of zirconia is
Brazilian baddeleyite ("Zirkite"), bad-
deleyite being naturally occurring zir-
conium oxide.

Archibald H. Ballard, associate direc-
(Please turn to page 256)



A group of fused stabilized zirconia shapes. These include bricks, molded tubes, extruded
shapes, cylindrical shapes, heat exchanger spheres and others

LADISH

Controlled Quality

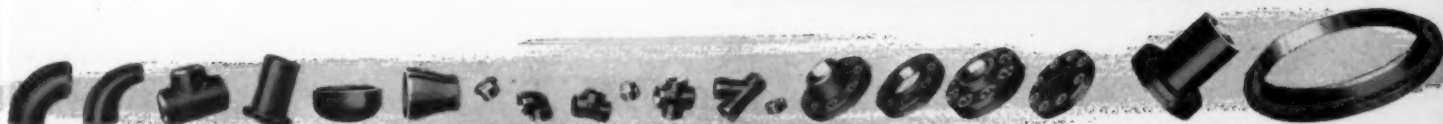


...When you judge by Operating Statements

Maximum strength and endurance to minimize shutdown losses and replacement costs...these are important operating economies you can trace directly to the laboratory safeguards of Ladish Controlled Quality. Advanced metallurgical controls over materials and forging methods assure complete dependability in every Ladish fitting.

LADISH CO.

District Offices: New York • Buffalo • Pittsburgh • Philadelphia • Cleveland • Chicago • St. Paul
St. Louis • Atlanta • Houston • Tulsa • Los Angeles • Havana • Toronto • Mexico City



**American Armament Demands Speed...
Speed Demands American Phillips Fastening**

**GET YOUR GUN
and get going!**



**Get More Speed...More
Accuracy...Firmer Fastenings...
the American Phillips Way**

If you've got a D-O, then "give it the gun"...the *American Phillips* gun... and watch the assemblies roll out faster than with any other fastening method... *as much as 50% faster!*

Power-driven American Phillips fastenings are easier and quicker for anyone to make... because recessed screwhead and 4-winged driver align automatically, and drive straight to a tight, flush fastening the first time, every time.

Have American engineer this top speed and accuracy into your assembly departments... with any Phillips product, including machine screws, SEMS assemblies, stove bolts, tapping screws, thread-cutting screws, wood screws, roll thread, thread-forming, thread-cutting and self-locking fastenings. Write:

AMERICAN SCREW COMPANY

PHILLIPS HEADquarters
WILLIMANTIC, CONNECTICUT

Plants at Willimantic
and Norristown, Pa.



Warehouse and offices
at Chicago

4-WINGED DRIVER CAN'T SLIP OUT
OF PHILLIPS TAPERED RECESS





On big jobs or little ones it pays to take advantage of Master's unusual ability to supply the RIGHT horsepower, the RIGHT shaft speed, the RIGHT construction features, the RIGHT mounting . . . all combined into one compact power package.

Don't put up with make-shift assemblies when you too may be enjoying these advantages. Master Motors, available in thousands and thousands of types and ratings (up to 150 HP) give you a selection you can get nowhere else.

Open, enclosed, splash proof, fan-cooled, explosion proof . . . horizontal or vertical . . . for all phases, voltages and frequencies . . . in single speed, multi-speed and variable speed types . . . with or without flanges or other special features . . . with 5 types of gear reduction up to 432 to 1 ratio . . . with electric brakes . . . with mechanical variable speed units . . . and for every type of mounting . . . Master has them all and so can be completely impartial in helping you select the one best motor drive for YOU.

Select the RIGHT power drive from Master's broad line and you can increase the saleability of your motor driven products . . . improve the economy and productivity of your plant equipment.

THE MASTER ELECTRIC COMPANY
DAYTON 1, OHIO

little ones or **BIG** ones

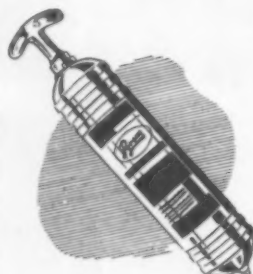


HERE'S WHAT YOUR

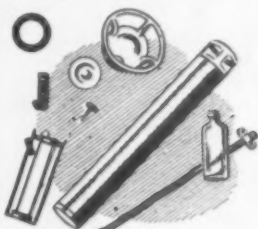
Pyrene
FIRE EXTINGUISHERS

SERVICE DEPOT

WILL DO FOR YOU



IMMEDIATE EXCHANGE
of repairable 1 and 1½ qt. Pyrene Vaporizing Liquid Extinguishers for factory-rebuilt models in perfect condition.



COMMON REPLACEMENT PARTS
for foam, soda-acid, cartridge-operated, and other Pyrene Extinguishers.



TRADE-INS
of old or damaged extinguishers of any make (Underwriters' Laboratories-approved) for brand-new Pyrenes!



RECHARGES
for all types of Pyrene Fire Extinguishers.



Instant extinguisher service at Pyrene Service Depots!

Get parts and replacement extinguishers immediately. No waiting!

Millions of Pyrene* Fire Extinguishers have totaled many millions of years of service. Eventually all extinguishers become old, worn or damaged. When an extinguisher needs to be repaired, you don't want to be without protection while you wait for service from the factory.

Now 180 Pyrene Service Depots, located in leading cities, eliminate such dangerous delays. They'll immediately exchange your repairable 1 and 1½ qt. Pyrene Vaporizing Liquid Extinguishers for factory-rebuilt. They'll trade in non-repairable ones of any U.L.-approved make on new Pyrenes. And they'll supply common replacement parts and recharges for all types of 2½ gal. Pyrene Extinguishers.

Pyrene makes a *complete* line of extinguishers for every hazard—everything from hand-operated models to large automatic systems. Write for addresses of your local distributor and service depot.

*T.M. Reg. U.S. Pat. Off.

At this sign you will find a
Pyrene for every fire hazard



PYRENE MANUFACTURING COMPANY

578 Belmont Avenue Newark 8, New Jersey

Affiliated with C-O-Two Fire Equipment Co.

N.P.A. Orders

Production Equipment Accessories

Use of "DO" ratings carried by defense orders to procure accessories for production equipment for companies working on rated orders, authorized by NPA. Ratings may be used for procuring jigs, dies, tools and fixtures where inability to procure these production equipment accessories would result in failure to meet delivery dates established in rated orders. Ratings may be used for accessories only if they are needed directly for the production of material for which a rating has been assigned. Reg 2, Amendment 3.

Chlorine

Order M-31, Part 36 Chemicals, Subpart A, Chlorine, requires producers and distributors to continue filling orders from their 1950 purchasers of chlorine, whether public or private, who are engaged directly in purifying water for human consumption and use or treatment of sewage. Orders are required to be filled equal to 1950 purchases, but producers and distributors are not required to deliver more than 25% of this amount in any month. Orders for public health chlorine are required to carry a certification of use.

Nickel

Order M-14 as amended. Provides for further conservation of nickel by permitting its use only in highly essential items. Order lists wide range of products in which nickel silver or nickel plate may not be used beginning March 1, and items in which nickel bearing stainless steel or high-content nickel alloys may not be used beginning April 1. Definitions of the four principal forms of nickel to which the action applies are: (1) Nickel silver—wrought or cast non-ferrous alloys containing 8% or more nickel; (2) Nickel plating—all plating regardless of procedure of application; (3) Stainless steel—wrought or cast chromium-nickel iron base alloys containing 6 to 22 percent nickel; and (4)

(Please turn to page 258)



NEW REFRACTORY

(Continued from page 252)

tors of Norton's research and development Department, says that the basic problem now is to improve manufacturing techniques for molding shapes and to lower the cost of manufacture still more.

In 1946 it was estimated that the cost of materials alone to make one zirconia brick (9 x 4½ x 2½) would approach \$14. A zirconia brick this size weighs 16 lbs.—almost twice the weight of fire clay brick. In 1951 Norton Company will sell a Fused Stabilized Zirconia brick of the same dimensions for \$9.43. This is quite unusual in view of the fact that in the four years since the estimate was made, prices have risen appreciably.

Your IMPERIAL DISTRIBUTOR

is . . .

Tubing Tool Headquarters

He offers a TOOL for EVERY JOB!

- tools for cutting, flaring, double flaring, bending, reaming, swedging and pinch-off of tubing . . .
- tools for copper, brass, aluminum, Bundyweld, stainless steel, JIC and other steel tubing . . .

He offers the FINEST in tubing tools!

- made by IMPERIAL — the pioneer and leader in tubing tools for more than 30 years . . .



TUBE WORKING HANDBOOK

If you work with or connect tubing by all means get this ready reference on modern tubing connection practice. It is a *must* for every man who has any problems in tubing connection. Gives practical how-to-do-it information on tube cutting, flaring, bending, reaming, etc. Ask for a copy of this valuable handbook today.

THE IMPERIAL BRASS MFG. CO. 512 S. Racine Ave., Chicago 7, Ill.
In Canada: The Imperial Brass Mfg. Co., 33 Church St., Toronto, Ontario

IMPERIAL

**Your Imperial Distributor Offers You
Such Outstanding Tools as These:**



**IMPERIAL Hi-Duty®
TUBE CUTTER**

The favorite with men who work with tubing. Free Wheeling Ball-Bearing Action makes tube cutting, faster, better, easier. Roller-type with flare cut-off groove. **No. 274-F** Hi-Duty Tube Cutter for hard or soft tubing $\frac{1}{8}$ " to 1" O.D. Other models for tubing up to 2 $\frac{1}{4}$ " O.D.

**IMPERIAL ROL-AIR®
FLARING TOOL**



**CONTROL KNOB
FOR BURNISHING**

The tool that both Flares and Burnishes Tubing. 3 rollers in spreader cone roll out the flare in the air. Note that flare is not formed against die block. Makes stronger flares—will not score the tubing. **No. 355-F** flares $\frac{1}{4}$ ", $\frac{5}{16}$ ", $\frac{3}{8}$ ", $\frac{1}{2}$ ", $\frac{5}{8}$ " O.D. Tubing.

IMPERIAL HAND TUBE BENDERS



These strong, smooth-operating, calibrated tube benders form neat accurate bends to a short radius without deforming tubing . . . bend to any angle up to 180°. Open side type. **No. 364-F** . . . individual benders for each size of tubing from $\frac{3}{16}$ " to $\frac{3}{4}$ " O.D. Also gear-type tube benders for $\frac{1}{2}$ " to 1- $\frac{1}{8}$ " O.D. tubing.

Specialists in

TUBE FITTINGS and TUBE WORKING TOOLS

Catalog 350 shows a wide range of sizes, types and styles. Write for copy.

"Look for the Diamond on every fitting and tool you buy"



BARNES FAMOUS BAND SAW BLADES



BAND SAWS

● HARD EDGE, FLEXIBLE BACK BAND SAWS

Available in Conventional Raker and Wavy Set Tooth and Skip Tooth

Packaged in LINE ARC 100 foot coils, LONG LENGTHS and WELDED BANDS

- SPRING TEMPER BAND SAWS
- WOOD BAND SAWS

● Handy **ARC LINE** Package

100 FOOT COILS

Raker Set—Wavy Set—Skip Tooth

Convenient, safe storage with no tangling are advantages of this handy package which permits blade to unwind easily.

● Economical LONG LENGTHS

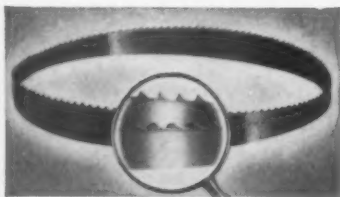
Long Length Coils come in random lengths for greater economy and less waste. Boxed for safety and convenience.

● WELDED BANDS

Barnes Welded Bands are heat treated to retain toughness and flexibility. Every weld is uniform in strength and alignment—as perfect as any other section of the blade—giving users both safety and economy.



THERE'S A BARNES' BLADE FOR EVERY BAND SAW OPERATION



Barnes' SKIP TOOTH

Hard Edge with flexible back, this blade is designed for high speed cutting of soft non-ferrous metals, plastics, compositions, fibres, wood, rubber, etc. Special tooth cuts faster, freer because of increased chip clearance.

BARNES' HARD EDGE FLEXIBLE BACK BAND SAW

A saw of extreme strength for cutting ferrous and non-ferrous metals and non-metallics. Selected alloyed steel together with careful heat treatment, permits fast cutting and assures long blade life. Teeth only are hardened, back is tough and flexible to assure proper flexing on machine.



W. O. BARNES CO., INC.

1299 TERMINAL AVE.

DETROIT 14, MICH.

(Continued from page 256)

high content nickel alloys—wrought or cast ferrous or non-ferrous alloys containing more than 22% nickel. Provisions of original order extended to include nickel salts, chemicals and residues derived as a by-product of copper refining. Certain usages necessary for repair parts to keep existing facilities in working order exempted.

Aluminum

Supplement 1 to NPA Del. 1, as amended: NPA expanded its delegation of authority to the Secretary of Defense under NPA's basic priority system. It permits the latter and those to whom he in turn re-delegates this authority to reschedule deliveries of all types of aluminum forms and products. It affects only the delivery schedules of aluminum for the aircraft and guided missiles programs, permitting the aluminum scheduled to be delivered to one manufacturer under either of these programs to be delivered to another manufacturer working on the programs when necessary.

Tungsten

Order M-30, Part 34, Tungsten provides for the allocation of all forms of tungsten (except tungsten ores and concentrates and tungsten scrap) based on end—use beginning March 1. It requires the use of tungsten substitutes wherever possible; limits the use of tungsten in all types of pigments and inks, except for U. S. Government printing of currency and bonds; limits use of tungsten in grinding wheels, and restricts the use of tungsten in high-speed steels. Persons with more than 50 lbs. of tungsten on hand the first day of each month are required to report the amount of their holdings by the 15th.

Iron and Steel

Order M-1, as amended, Part 20, Iron and Steel: Amendment increases most of percentage ceilings on quantities of various products for which suppliers are required to accept "DO" orders; establishes specific inventory controls; adds several ferrous products to the list of steel mill products originally covered; establishes minimum mill quantities for rated or other NPA directed orders, and lengthens some of the previous lead times for filling rated orders.

Anti-Hoarding List

NPA Notice 1, Part 9, Scarce Materials. Several items added to list of materials subject to anti-hoarding provisions. Materials are now subject to both inventory control and anti-hoarding regulations. List of items covered by anti-hoarding provisions of public Law 774 is virtually the same as that included in the inventory control regulation (NPA Reg. 1) issued Sept. 18. Items added to the anti-hoarding list include: Industrial ethyl alcohol, chlorine, zinc dust and oxides, natural and synthetic rubber, and the following textile materials: burlap (hessian), cotton pulp, high tenacity

(Please turn to page 260)

WOULD YOU LIKE
LONGER LIFE
and FREEDOM
from BREAKDOWNS
IN YOUR SMALL ENGINES?

Specify
BENDIX
THE MOST TRUSTED NAME
IN MAGNETOS

- ✓ Simplicity in design.
- ✓ Waterproof moulded coil.
- ✓ Lower operating cost.
- ✓ Minimum lubricating requirement.
- ✓ Light in weight.
- ✓ Higher voltage at starting speed.
- ✓ Constant spark over entire speed range.
- ✓ Compact and sturdy construction.

Whether you purchase a small engine for outboard, industrial or marine use, today's foremost consideration should be long life and trouble-free performance. Therefore, it will pay you well to insist on Bendix magnetos in the engine you select. For the basic design of Bendix magnetos assures quality performance for *every type* of small engine and *every pricing requirement*. Remember it pays to specify Bendix, the most trusted name in magnetos. Complete information available on request.

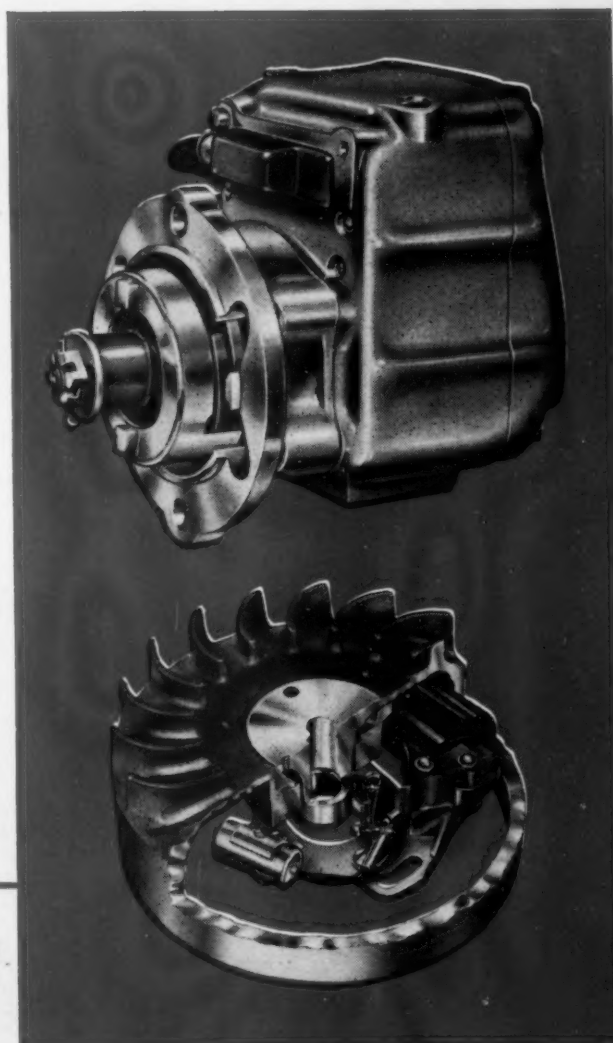
**SCINTILLA MAGNETO DIVISION of
SIDNEY, NEW YORK**

Bendix

Export Sales: Bendix International Division
72 Fifth Avenue, New York 11, N.Y.

Bendix
AVIATION CORPORATION

FACTORY BRANCH OFFICES: 117 E. Providencia Avenue, Burbank, California •
23235 Woodward Avenue, Ferndale, Michigan • 7829 W. Greenfield Avenue, West Allis 14,
Wisconsin • 582 Market Street, San Francisco 4, California





A Forest City Foundries metallurgist takes a temperature reading with an optical pyrometer.

Make it Better with Gray Iron

Forest City Gray Iron Castings ARE THE FRUIT OF Modern Scientific Research



Proper utilization of the excellent castability and machinability of gray iron, and its inherent economy, have brought about increasing use of gray iron castings by the principal basic industries.

Through membership in the Gray Iron Research Institute, Inc., which co-operates with the world-famous Battelle Memorial Institute of Columbus, Ohio, Forest City Foundries are equipped to translate the results of scientific research into direct commercial benefits. Many of the gray iron castings we are producing today have physical properties considered impossible a few years ago.

We shall be glad to discuss your special requirements and our ability to meet them with gray iron castings, S.A.E. or A.S.T.M. specifications, plain or alloyed, produced in our two modern mechanized foundries.

Enlarged photomicrograph showing laminated structure of pearlite, the high-strength constituent of gray iron.

The FOREST CITY FOUNDRIES Company

2300 WEST 27TH STREET • CLEVELAND 13, OHIO
TELEPHONE TOWER 1-5040

(Continued from page 258)

rayon yarn, and nylon staple and nylon filament yarn.

Methylene Chloride

Order M-21, Part 74. Order assures supplies of methylene chloride for the manufacture of photographic and X-ray film. M-21 permits the use of only the so-called "paint remover grade" of methylene chloride for making paint remover and dry cleaning aids. Refined or refrigerant grade of methylene chloride reserved for purposes where paint remover grade cannot be used, and requires a written certification from anyone buying the refined grade for use in the manufacture of photographic film or medical or industrial X-Ray film.

Tin Scrap

Amendment to Order M-8: To insure maximum use of tin scrap in the production of pig tin, smelters and refiners of secondary tin are permitted to use as much tin scrap and other secondary tin-bearing materials that result from normal processes in the production of pig tin, alloys or chemicals. Secondary tin is defined as any alloy produced from scrap which contains less than 95% but not less than 1.5% by weight of the element tin.

Commercial Construction

Order M-4, amended Part 74, Construction: Virtually all new private commercial construction subject to specific NPA authorization. Order places no restrictions on the construction of wholesale food establishments or wholesale supply facilities for fuel oil, gasoline, coal, gas distributing systems and pipelines, and does not affect storage or warehouse buildings used by manufacturers or processors. The order forbids any person to accept, an order for, sell, or deliver any material, equipment or supplies which he has reason to believe will be used in violation of the regulation. Applications for construction authorization will be submitted on forms to be provided by NPA, to regional office of the Department of Commerce in whose area the construction would be situated.

Zinc

Order M-15, amended, Part 28-Zinc, Subpart B—use of zinc. Zinc order amended by adding definitions omitted from the original text. New paragraph to section 28.22 of the original order, defines "manufacture" as "(e) 'Manufacture' means to put into process, machine, incorporate into products, assemble, fabricate or otherwise alter the forms and products of zinc defined in section 28.23 by physical or chemical means."

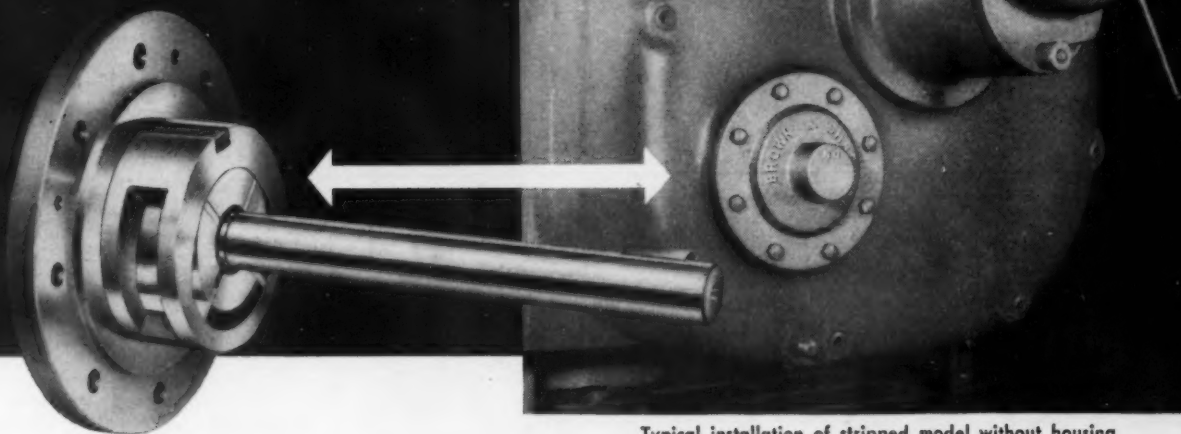
Paragraph (a) of section 28.23 of the original order is replaced by the following: ("a") 'Zinc' which means slab zinc which has been produced by electrolytic, electrothermic, or fire refining process, including zinc produced from scrap, dross, other secondary material, and any alloy in which the percentage of zinc by weight is more than 50%.

(Please turn to page 262)

COMPACT

AUTOMATIC REVERSING VANE PUMPS...

for individual
lubrication of
machine units



Typical installation of stripped model without housing
in modern metal-working machine.

You get modern appearance when you equip machines with stripped models of Brown & Sharpe Automatic Reversing Vane Pumps. They're extremely compact . . . yet sturdily built for continuous, trouble-free service.

Brown & Sharpe *Stripped Models with housings* (Nos. 8022, 8062, and 8102) are very easily installed, particularly where internal discharge and suction ports are not readily incorporated in the machine design or when outside piping is desirable. *Stripped Models without housing* (Nos. 8023, 8063

and 8103) wherever installed, offer minimum projection from machine surfaces. Designed for use as integral parts of machines where suction and discharge ports can be incorporated in machine castings.

Fully-automatic reversing with unidirectional flow is a feature of all these pumps. Sizes available: 2½, 5 and 11½ g.p.m. at 0 lbs. pressure and at 1140 rpm. These and other features are fully described in Bulletin. Write Brown & Sharpe Mfg. Co., Providence 1, R. I., U.S.A.

WE URGE BUYING THROUGH THE DISTRIBUTOR

Brown & Sharpe





THERE'S SOMETHING FOR YOU

AT THE 4TH

**CANADIAN INTERNATIONAL
TRADE FAIR**

TORONTO MAY 28 - JUNE 8, 1951

DEDICATED TO THE PROMOTION OF INTERNATIONAL TRADE BY
THE GOVERNMENT OF CANADA

SMALL STAMPINGS



ANY METAL, ANY QUANTITY
30 years' experience gives us the "know how".
Hundreds of satisfied customers are evidence
of our high quality.

THE MASTER PRODUCTS CO.
6400 PARK AVE. • CLEVELAND 5, OHIO

(Continued from page 260)

Aluminum Scrap

M-22, Part 26 Aluminum, Subpart C—Distribution of Aluminum scrap. Order M-22 issued to prevent undue accumulation of aluminum scrap. Order provides that only approved smelters or fabricators may melt, smelt or otherwise use aluminum scrap, except upon special authorization. Foundries, under certain conditions are permitted to remelt the gates, sprues, risers and defective castings resulting from own operations. Scrap is defined as "materials or objects which are the waste or by-products of industrial fabrication . . . which contain 50% or more by weight of recoverable aluminum. All persons other than producers, approved smelters, approved fabricators or dealers, who own or originate scrap are required to deliver the scrap to any producer, approved smelter, approved fabricator or dealer, and not dispose of it in any other way. Thirty-two approved aluminum smelters and four approved aluminum fabricators are listed in the order.

Carded Cotton Sales Yarn

Order M-23, Part 75—Carded Cotton Sales Yarn: Order provides for equitable distribution of defense rated orders among producers of carded cotton sales yarn. Order limits to 10% the volume of rated orders each producer of carded cotton sales yarn must accept. Rated orders must be placed at least 15 days before the first day of the month in which shipment is requested. Producer may reject defense orders if they are for a type of yarn not normally made by him and are of a type that would cause lack of balance in mill production.

Hog Bristles

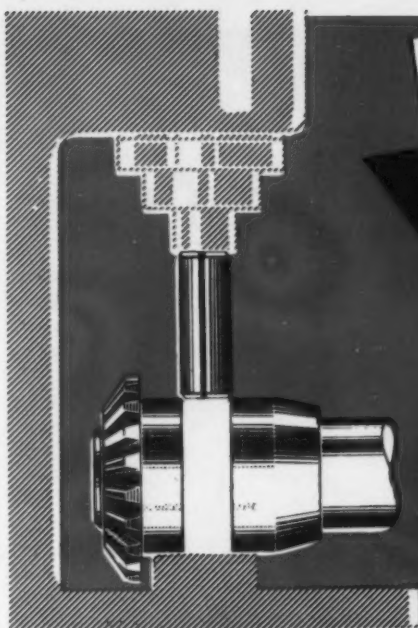
M-18, as amended, Part 73 Pits' and Hogs Bristles. Amended order governs the use inventories, and distribution of hog bristles and bristle products. Brushes and other bristle products requiring bristle longer than two and 5/8" must now contain at least 30% by weight of filler material. Exempt from this provision are bristle products manufactured for U. S. Government agencies. Horse-hair is commonly used filler material in certain types of brushes; Nylon is used in place of hog bristles in the manufacture of various brushes. Action also limits manufacturers' inventories to 120 days; and specifies that no person may bleach or cut hog bristles which are longer than 2-5/8".

Freight Cars

M-1, as amended, Part 20—Steel. NPA will authorize purchasers to order the amounts of materials necessary to meet their contracts under the freight car program. In placing certified orders, purchasers will specify exactly the kind and amount of materials needed, and the period during which shipment is required. Order must certify that purchase has been authorized by NPA. Amount of steel authorized is sufficient to produce

(Please turn to page 266)

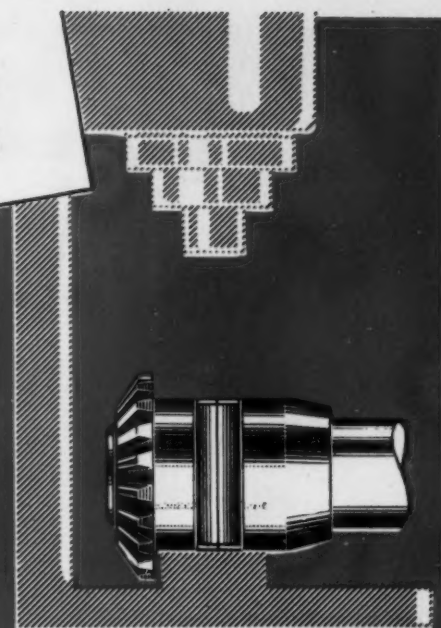
ROLLPINS... THE NEW IDEA IN FASTENERS



Rollpins are easily pressed into drilled hole—chamfered ends permit insertion by hand or by hydraulic or hopper-fed press.



Rollpins compress as they are driven... are self-locking in normal production-drilled holes... eliminate reaming and peening.



Rollpins fit snug, lock permanently in place. Constant spring tension against the walls of the hole fix Rollpins firmly in position.

How to cut pinning costs with Rollpin self-locking fasteners

Investigate now the real production savings on every type of job involving pinning. Rollpin self-locking fasteners are ready to help you do away with expensive reaming, peening, machining and threading operations by replacing taper pins, grooved pins, rivets and set-screws.

Quickly inserted into standard drilled holes, Rollpins are there to stay—vibration-proof until removed with a pin punch... and Rollpins can be *re-inserted* with a hammer! A neat, clean, self-locking assembly is provided; and Rollpins exceed the shear strength of a cold rolled pin of equal diameter.

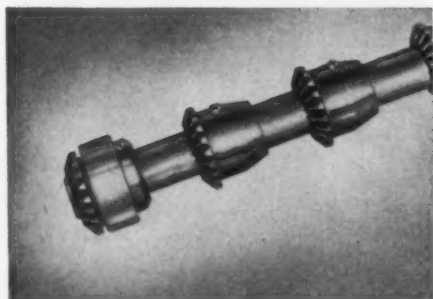
Slashing assembly time, inspiring new product designs, simplifying old fastening procedures, Rollpins are now

helping cut manufacturing costs as steel fastening pins holding pulleys and gears to shafts, as pivot or hinge pins, clevis pins, cotter pins, shafts, and locating dowels.

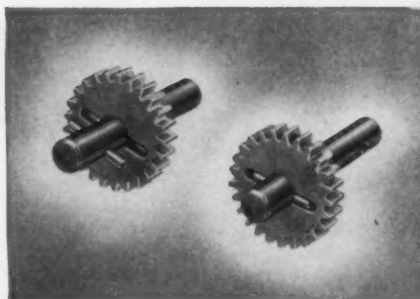
Get the latest information about your application. Write to Elastic Stop Nut Corporation of America, 2330 Vauxhall Road, Union, New Jersey.



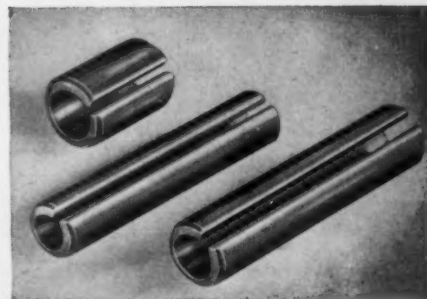
ELASTIC STOP NUT CORPORATION OF AMERICA



More than 20 gears are quickly Rollpinned to gear train shaft used on farm equipment. Assembly time was cut... field service problems were solved because Rollpins drive out readily.

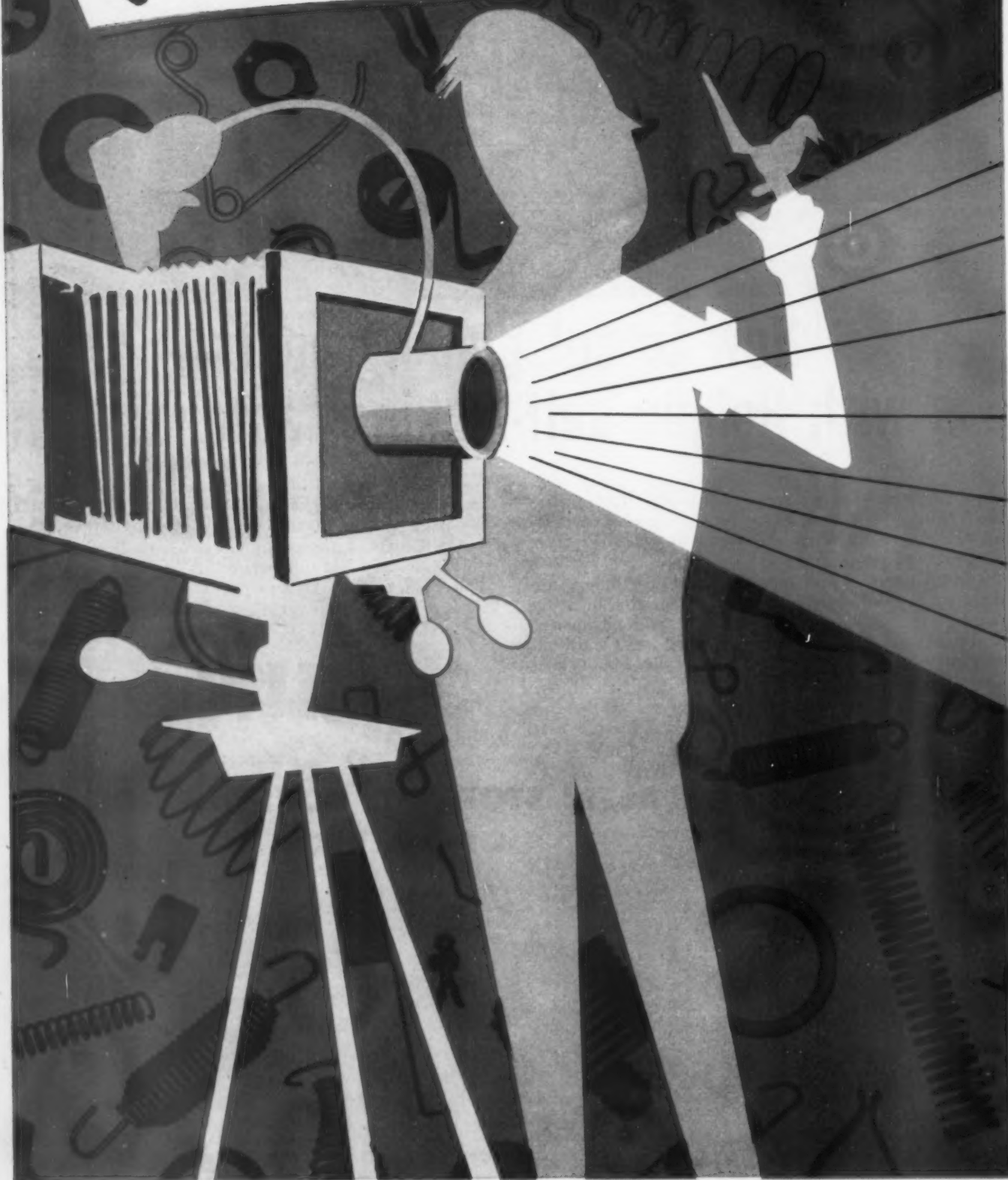


Rollpin is used as a self-retained pin in shaft... which is press-fitted into recess molded into sintered gear. Rollpin's unusual shear strength makes it ideal for this use.



Rollpins are supplied to specified lengths with chamfered ends. They are available from stock in a wide range of lengths in diameters from 5/64" to 1/2" in Carbon and Stainless Steels.

Group Picture of Group Service-



DIVISIONS OF ASSOCIATED SPRING CORPORATION AND CANADIAN AFFILIATE

....**SPRING-MINDED**

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**B-G-R
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ANN ARBOR
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DAYTON, OHIO

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Active field service
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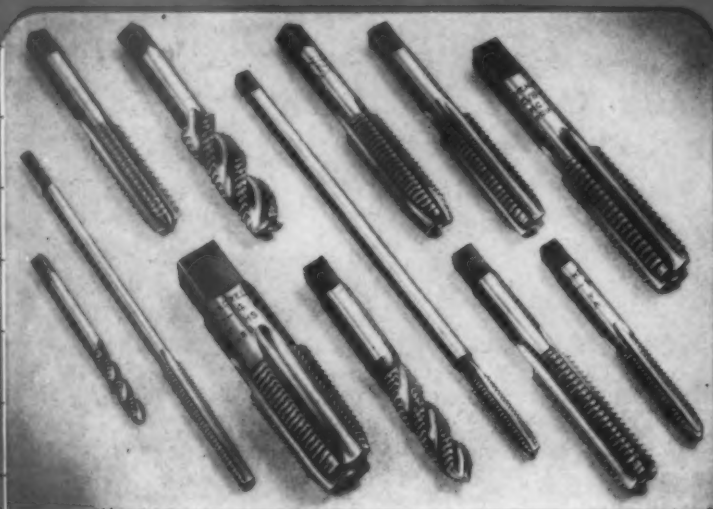
10

THE BEST ~~ten~~ SOURCES FOR MECHANICAL SPRINGS

Threadwell
Tools do
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they can do your tough ones



Let's face it. This is no time to be pussyfooting around hoping that this and that will work out. This is a time when more work and less talk is no joke but a grim necessity. Threadwell Taps and cutting tools will do more work for you, and their superior performance will do our talking for us. We think you can save a lot of precious time and money by specifying Threadwell in the first place.

Threadwell

THREADWELL TAP & DIE CO. GREENFIELD, MASS

(Continued from page 262)

new cars at the rate of 10,000 a month, and permit repair and maintenance of used cars.

RUBBER

Order M-2, as amended. Simplification of styles, types and colors in rubber products, and reducing or eliminating the use of natural rubber in non-essential products beginning March 1st. In March, total new rubber consumption will be permitted at 76% of adjusted base period use, natural rubber at 35%.

Combat Type Gloves

M-29, Part 76, Horsehide Fronts and Deerskins. Reserves for "DO" defense rated orders that portion of the supply of leather produced from horsehide fronts and deerskins, which meet Federal specifications, which may be processed by tanners for military leather only. Materials covered are horsehide fronts including colt, mule, ass, donkey, pony hides and skins; and, deerskin including the skin of the elk, moose and caribou.

Iron and Steel Scrap

M-20, Part 24—Iron and Steel Scrap. Designed to keep scrap moving to iron and steel producing mills. Governs inventories of iron and steel scrap held by scrap dealers and brokers, and automobile wreckers or producers of scrap. Scrap inventories limited to a practicable working minimum, or the level of the preceding 60 days, whichever is less. Firms covered must retain for two years, records of receipts, deliveries, inventories and use of iron and steel scrap. Limitations do not apply to those engaged in demolitions, nor to those engaged in normal seasonal accumulations of scrap later shipped by vessel or other type of water transport. Scrap means all ferrous materials, either alloyed or unalloyed, of which iron or steel is principal component.

Air Transport

Delegation 6. C.A.A. authorized to issue "DO" defense rated orders for maintenance and expansion of civil air transport and Federal Airways System. Authority covers procurement of materials for construction of new planes as well as necessary replacement parts for present aircraft.

Tin

Orders M-8, Part 27—Tin; 24, Part 23—Tin Plate and Terne Plate; Order M-25, Part 102 — Cans; M-26, Part 103 — Tin-plate closures; M-27, Part 101, Collapsible tubes. NPA issued five orders which permit the use of tin only in certain products, and limit its use in others. No restrictions under the new order on the packaging of perishable foods. New regulations supersede and amend basic tin order M-8. Certification is required for all non-defense use of tin plate and terneplate. Use of tin in collapsible tubes is limited, according to products

(Please turn to page 268)

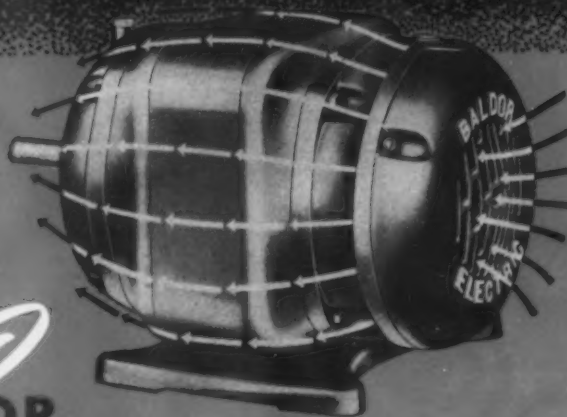


PHOTOGRAPH BY RUSSELL C. AIKINS

You've got to have a real feeling for it . . . then you can tell by touch, sight, smell, and even taste (that is, *good* taste!) when Brass is at its best. And when it is, it's *Bristol Brass* . . . made by seasoned Brass men who *know how*. That's why you can bank on Brass sheet, rod and wire made by The Bristol Brass Corporation, Bristol, Conn., since 1850. Offices or warehouses in Boston, Chicago, Cleveland, Dayton, Detroit, Los Angeles, Milwaukee, New York, Philadelphia, Pittsburgh, Providence, Rochester.

Another insight into the full meaning of: **"Brass made Bristol-Fashion"**

DON'T LET DUST, DIRT, LINT OR FUMES SHORTEN THE SERVICE LIFE OF YOUR MOTORS



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Streamcooled **BALL-BEARING
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These motors are **SOLIDLY ENCLOSED**, cooled by an outer-mounted fan in the bell-end. They cannot inhale dust, dirt, lint, or other contamination. There is no air passageway to clog up and cause burnout or lowered efficiency.

BALDOR Streamcooled Motors require no dismantling for cleaning. Thus **LESS SERVICING** . . . no interruption of production or service. Let us tell you more about these long service-life BALDOR Motors.

BALDOR ELECTRIC CO. • ST. LOUIS 10, MO.

Baldor

MOTOR SPECIALISTS FOR 30 YEARS

Baldor Motors are sold and serviced in more than 300 trade centers

(Continued from page 266)

packaged. Use of aluminum in making collapsible tubes is permitted up to 90% of the average monthly use from August 1st through Nov. 30, 1950. All uses of tin not expressly authorized by NPA are prohibited and certification is required with all deliveries. M-27, Collapsible tubes: Purchasers are required to certify their compliance with the order before manufacturers are permitted to sell or deliver tubes.

Molybdenum

Order M-33, Part 36—Molybdenum. Present supplies not adequate to meet demand to fill DO orders and those for material to be used in other items also important to national welfare. NPA issued directives to producers, handlers and marketers to make no deliveries of molybdenum in any form on orders except those having DO ratings, or those non-rated orders for molybdenum to be used in high-speed steels; also, not to deliver in excess of 50% on either DO orders, or on the non-rated orders for moly to be used in high-speed steels.

Copper

M-16, as amended, Part 29—Copper and Copper Base Alloys, Subpart C—Distribution of Copper and Copper Base alloy Scrap. Miscellaneous producers such as foundries, chemical plants, iron foundries and aluminum foundries, are permitted to melt and process copper scrap generated in their own plants. Amendment 2 to Order 16 regulating the acceptance, delivery and distribution of copper scrap and copper-base alloy scrap. Order permits miscellaneous producers who require raw material in their regular production operations to accept from dealers the types of scrap specified in the order for melting and processing.

ALUMINUM

M-5, amended; M-7, Amendment 2. Rules for handling defense orders for aluminum under the priorities system are revised to require aluminum producers and fabricators to accept a larger percentage of defense rated (DO) orders. There is no change in the percentage of DO orders distributors and jobbers must accept, and 60-day lead time is continued.

Conservation Order M-7, amended to provide savings in civilian uses. Revised order lists more than 200 less essential items in which aluminum may not be used after April 1. It does not permit the use of aluminum in the manufacture of decorative or ornamental items, or the use of more or better grade aluminum than is necessary for functional operation of any item.

ADDITIONAL NPA NEWS

WILL BE FOUND ON

PAGE 324 AND

FOLLOWING

FIGHT WASTE



'N PEACE WASTE IS A SIN...
NOW... WASTE IS A CRIME!

DISSTON Announces a New WASTE PREVENTION PLAN

for increasing productive efficiency

In the face of growing shortages of tools, materials, and manpower, American industry is daily receiving new demands for higher and still higher production...

NOW COMES THIS NEW DISSTON PLAN TO HELP YOU GET MORE OUT OF YOUR TOOLS, MATERIALS, AND MANPOWER—TO HELP YOU INCREASE PRODUCTION, CUT MANUFACTURING COSTS—BY STOPPING WASTE!

DISSTON GIVES YOU THE PLAN READY TO USE!

The foundation of this "Fight Waste" program lies in educating workers to use tools properly. For this purpose, Disston will supply you—without cost or obligation—with individual instruction cards containing specific facts on the most efficient use and care of the cutting tools listed below. Use of

these cards simplifies and multiplies supervision, speeds training of new and unskilled men, helps make the most productive use of time, effort, and equipment! You also get complete instructions on how to distribute the cards in your plant.

ORDER THESE CARDS IN ANY QUANTITIES:



- No. 1 Power Hack Saw Blades
- No. 2 Hand Hack Saw Blades
- No. 3 Milling Saws—Circular High Temper
- No. 4 Fast Running Metal Saws—Circular—Medium and Mild Temper
- No. 5 Carbide Saws
- No. 6 Carbide Knives, Cutters, Etc.
- No. 7 Flexible Back Metal Band Saws
- No. 8 Inserted Tooth Circular Metal Saws
- No. 9 General Information on Files
- No. 10 Saw Files
- No. 11 Machinists' Files
- No. 12 Special Purpose and Wood Working Files
- No. 13 Superfine Swiss Pattern Files
- No. 14 "Rights and Wrongs" in Refitting Circular Saws
- No. 15 Wide Band Saws—Log Mill Saws
- No. 16 Narrow Wood Cutting Band Saws
- No. 17 Dado Cutters
- No. 18 Solid Tooth Circular Wood Cutting Saws—Flat Ground—Rip and Cross-Cut

- No. 19 Circular Wood Cutting Combination Saws—Hollow Ground—Raker Tooth Type
- No. 20 Circular Wood Cutting Combination Saw—Flat Ground—Raker Tooth Type
- No. 21 Solid Tooth Circular Edger Saws
- No. 22 Solid Tooth Circular Trimmer Saws—Flat Ground
- No. 23 Narrow Band Saws for Cutting Plastics
- No. 24 Solid Tooth Circular Plastic Saws—Hollow Ground
- No. 25 Circular Knives
- No. 26 Paper Knives
- No. 27 Thin Planer Knives
- No. 28 Heavy Planer Knives
- No. 29 Veneer Knives—Rotary and Slicer
- No. 30 Chipper Knives
- No. 31 Cutter Heads—Circular, Generated and Straight Knife Types

ALSO: "The Pocket Foreman"—a complete manual for the use of foremen and other supervisory workers on how to FIGHT WASTE in their departments—how to boost the productivity of their men. Contains a complete set of "Fight Waste" Cards as a guide in ordering.

GET COMPLETE DETAILS

Your Disston distributor will gladly give you information on applying this plan in your plant—help you determine your needs for "Fight Waste" material. Consult him or write Disston direct.



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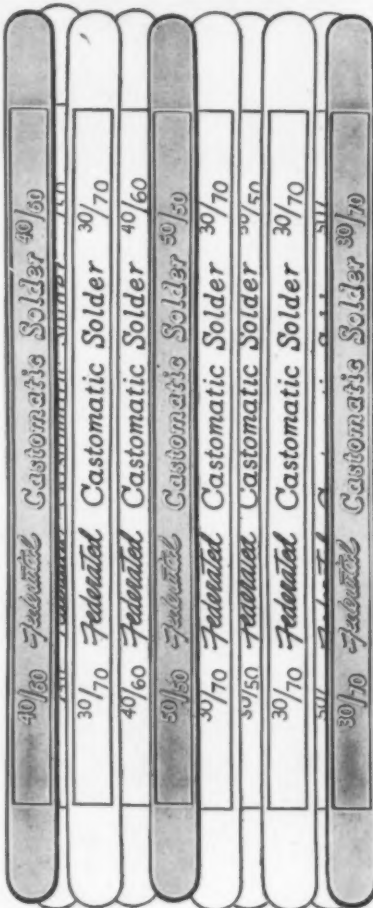
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... may be had with either a pure rosin flux or a quick-acting acid flux. Available in a variety of alloys and special compositions. Listed by Underwriters' Laboratories, Inc.



CASTOMATIC BAR SOLDERS

... revolutionary new oxide-free solders that are cast on patented machines. All are absolutely uniform in composition and weight. All bars of a given composition melt at the same temperature. Available in all standard analyses.



SOLID WIRE SOLDERS

... free-flowing solders that are ideal for general purpose work. Standard alloys from stock ... others on request.



Federated first for
ALL SOLDERS

Federated Solders are consistently uniform alloys of tin and lead ... prepared by experienced craftsmen under strict metallurgical control ... from the best materials available.

Federated also makes all commercial pig, drop, foil, ingot, triangle, strip, wiping and segment solders.

To order or for further information, call or write one of Federated's 22 sales offices across the country. There is one near you.

Federated Metals Division

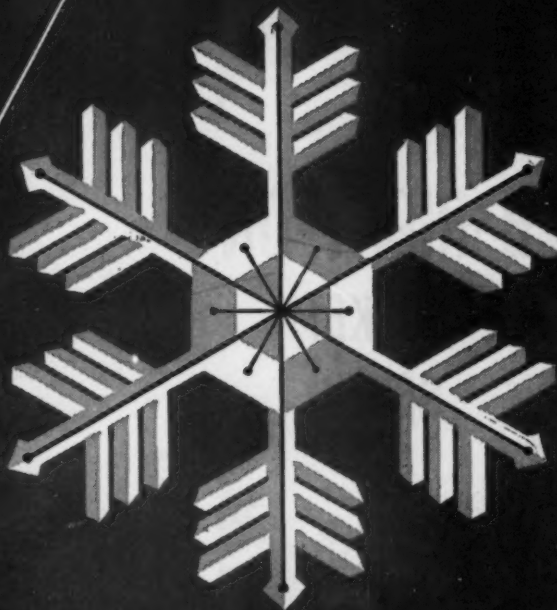


AMERICAN SMELTING AND REFINING COMPANY • 120 BROADWAY, NEW YORK 5, N. Y.

Cellular Rubber* that Works



...at 450°F above



or 100°F below...

* Silicone Spongex Stock 9727

Is your product headed for altitudes never reached by commercial aviation? For climates where refrigerators, television sets and pleasure cars refuse to function? And on top of that . . . must you have insulation against shock, sound and vibration or against the passage of dust, air, temperature or moisture? Such a product will need cellular rubber components.

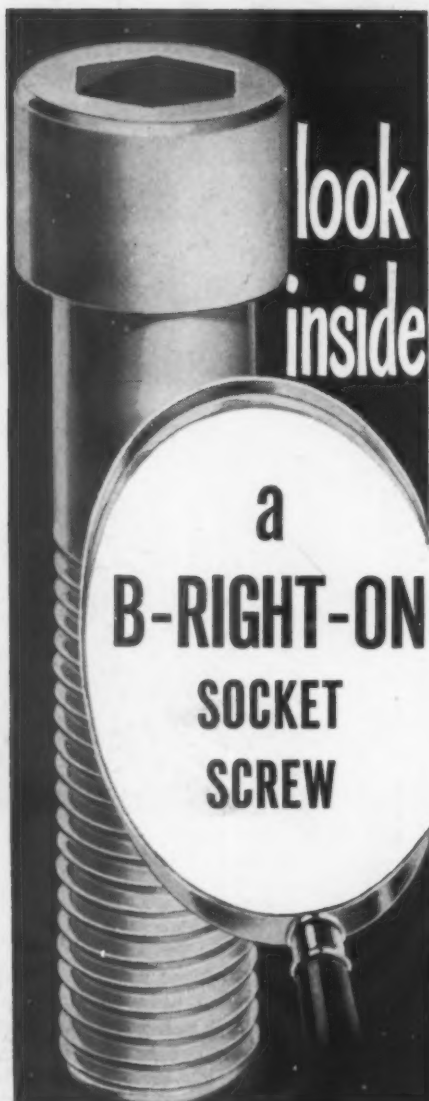
In the range from the soft, porous *Spongex* used as an iron lung collar seal to the rigid, featherweight *Spongex Cell-Tite* used as a carburetor float may be found the answer to your problem. If not, we'll work it out for you.

SPONGEX[®]
CELLULAR RUBBER



The World's Largest Specialists in Cellular Rubber
THE SPONGE RUBBER PRODUCTS COMPANY

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There's more than meets the eye in a Brighton Socket Screw! Brighton Nu-Process, an entirely new metal working process, forms special alloy-steel into screws with continuous unbroken fibers and fine, compact grain. This greater toughness allows greater strength and hardness.

New catalog now ready. Write for your copy. The Brighton Screw & Manufacturing Co., 18-29 Reading Rd., Cincinnati 2, Ohio.

BRIGHTON
Screw & Mfg. Co.

PACKAGING EXPOSITION TO BE 25% LARGER THAN A YEAR AGO

The 20th annual National Packaging Exposition, to be held April 17-20 at the Auditorium in Atlantic City, N. J., will be about 25% larger than last year's show, according to the American Management Association, sponsor of the event. The annual Conference on Packaging, Packing and Shipping, will be held at the Auditorium the first two days of the show.

Featured at the Conference will be a panel session at which representatives of the Army, the Navy, and the Air Force will discuss government specifications for packaging, and answer questions from the floor. Reports on new technical advances in packaging and on the probable effect of government demands on the availability of the various types of packaging materials, will be given also.

Further information in regard to the Conference and Exposition may be obtained from the American Management Association, 330 West 42nd St., New York, N. Y.

1 1 1

FREE-PISTON POWER PLANT

A revolutionary free-piston power plant which combines conventional diesel engine thermal efficiency with the advantages of gas turbine operation is described in a report available from Office of Technical Service, Department of Commerce, Washington, D.C. Supplementing previously published information on this French developed engine, the report deals with the problem of obtaining operating stability, achieved despite the absence of con-rod and crankshaft linkages. The free-piston gas producer is actually a supercharged 2-cycle diesel producing exhaust gas at 75 psi pressure and 900-950 deg. F. which generates power by expansion to atmospheric pressure in a gas turbine.

Order PB 100 124, "Operating Stability of Floating Piston Gas Generators", \$7.75 microfilm, \$2.50 photostat, from Library of Congress Publication Board Project.

1 1 1



It rolls... it folds in any direction!



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TIME

SPACE

MATERIAL

MONEY

SHELLCREASE is flexible yet provides full protective qualities of corrugation. Easily "molded" around any shaped item, eliminating costly, space-wasting stuffings. Reduces shipping weight and costs.

Use any kind of fastening... no outside wrapping. Approved under Army and Navy Specs. 72" rolls, 250 feet long, also Sheets cut to order. 35, 55, 70 and 100 lb. basis.

Write Dept. 591-I for samples and literature

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591 Ferry St., Newark 5, N. J.
CORRUGATED PAPER PRODUCTS SINCE 1919

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The ONLY chemical directory that lists PRODUCERS AND MANUFACTURERS EXCLUSIVELY. Grades and purities are shown separately. Listings are entirely free and impartial.

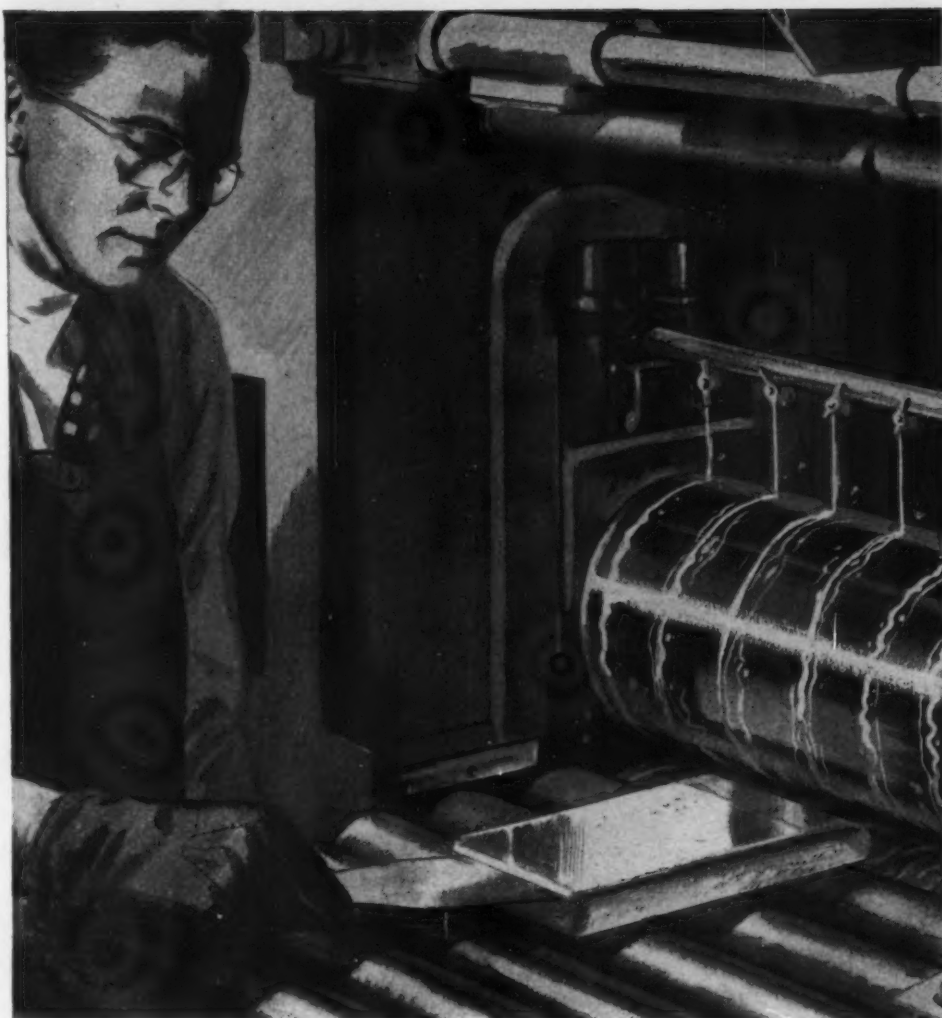
An unprecedented market research work covering the American chemical industry, listing

Chemical Raw Materials Dyestuffs Industrial Chemicals Fine Chemicals and their producers and manufacturers, with pertinent buying data including synonyms, trade names, form, packing, shipping regulations and shipping point of every grade.

Price: \$20 postpaid.

Write today to:

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Dept. W, 330 W. 42 St., New York 18, N.Y.



"Tom Thumb" proving ground—for you!

THE illustration above gives you some idea of the miniature laboratory mill operated by Kaiser Aluminum.

In it, alloys are tested to determine how they will behave under rolling-mill conditions. It also helps develop new alloys to ease problems of fabrication. And it helps work out methods for better plant control of processes.

The lessons learned are applied in producing the aluminum sheet, circles or coils that go to you.

Such practical research as this—combined with unsurpassed quality and service

—explains why Kaiser Aluminum has earned the confidence of thousands of manufacturers of hundreds of different products.

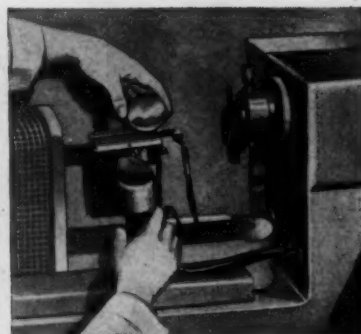
. . .

To help meet critical aluminum needs, Kaiser Aluminum has begun a vast expansion program which will greatly increase production of primary aluminum. When conditions permit, this aluminum will be shared by manufacturers of civilian products. Meanwhile, if you have aluminum fabrication problems, call any office listed below.

Kaiser Aluminum

Setting the pace . . . through quality and service

SOLD BY KAISER ALUMINUM & CHEMICAL SALES, INC., KAISER BUILDING, OAKLAND 12, CALIFORNIA
OFFICES IN: Atlanta • Boston • Chicago • Cincinnati • Cleveland • Dallas • Denver • Detroit
Houston • Indianapolis • Kansas City • Los Angeles • Milwaukee • Minneapolis • New York
Oakland • Philadelphia • Portland, Ore. • Rochester, N. Y. • Seattle • Spokane • St. Louis
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METALLURGICAL LABORATORY. Kaiser Aluminum's automatic quantometer analyzes samples of metal still in furnaces. Thus, when Kaiser Aluminum is poured every ingot measures up exactly to rigid specifications.



METALLOGRAPHIC LABORATORY analyzes magnified specimens of Kaiser Aluminum to make sure chemical structures coincide with the uses to which alloys will be put by you.



CHEMICAL LABORATORY makes frequent analyses to maintain the high quality that Kaiser Aluminum customers always get.



PHYSICAL TESTING LABORATORY makes sure all Kaiser Aluminum customer specifications are met exactly. Samples of every order are tested for tensile and yield strength, fatigue properties, grain size, hardness, etc.

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ROUND

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LOW CARBON
HIGH CARBON
STAINLESS
SPECIAL ALLOY
ARMCO IRON

**You draw the Shape
—Page can draw
the Wire**

—the way you want it
for your production—whether
it's ALL of your product,
or only a part.

Cross-sectional areas up
to .250" square; widths to $\frac{3}{8}$ ";
width-to-thickness ratio
not exceeding 6 to 1.

for Wire or
Information about Wire—

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PAGE STEEL AND WIRE DIVISION
AMERICAN CHAIN & CABLE

MATERIALS HANDLING CONFERENCE TO BE HELD IN CHICAGO

Many problems of materials handling in the metal and machinery fields will be considered at the Materials Handling Conference which will be held concurrently with the National Materials Handling Exposition at the International Amphitheatre, Chicago, April 30-May 4, inclusive. The conference is sponsored by the American Material Handling Society.

The six acres of exhibits and the outdoor area of four acres will comprise the most extensive display ever assembled of cost reducing handling equipment in operation. The exposition is conducted by Clapp & Poliak, Inc., 341 Madison Ave., New York 17, N. Y., from whom advance registration cards may be obtained.

1 1 1

NATION'S FUTURE IN OIL

Starting in 1874 and continuing up to date, we have constantly heard predictions that we were running out of oil in this country, and would have to rely on oil from foreign lands, stated H. B. Fell, executive vice president of the IPA, at meeting Petroleum Branch of the AIM&ME in New Orleans. From time to time in the past, he continued, many estimates were made by men of recognized ability, as to the quantity of oil remaining in this country, and prophesied, based on their estimates, a rather early dissipation of our oil reserves.

In 1922 the United States Geological Survey estimated the oil reserves in the United States as around nine billion barrels, of which five billions might be classified as oil in sight, and four billions as prospective and possible. They stated in their observations, "The United States is already absolutely dependent on foreign countries to eke out her own production, and if the foreign oil can be produced this dependence is sure to grow greater and greater as our fields wane."

In 1900 we had less than three billion barrels of reserve and only produced 200,000 barrels of oil per day.

In 1919 we had reserves of about $6\frac{1}{2}$ billion barrels and produced slightly over one million barrels per day.

In 1940 we had increased our reserves to $18\frac{1}{2}$ billion barrels and our average daily production to about 3,700,000 barrels.

As of January 1, 1950, our proved reserves had reached an all time peak of nearly $28\frac{1}{2}$ billion barrels. During 1949 our average daily production was approximately five million barrels, and we are currently producing over 5,900,000 barrels per day. Based on the most reliable estimates available, it appears we could increase our present high rate by a few hundred thousand barrels per day, without damage to the wells. Unless our war demands increase substantially, we will probably have to reduce the present rate of production to some extent to conform to market demand.

Some geologists estimate that the areas in this country which have petroleum possibilities total almost two billion
(Please turn to page 276)



*Here's a
Better
Bearing!*

American Crucible methods,
experience, know-how, and
equipment save you real
money.

Bearings, bushings and
wearing parts, machined or
rough cast from



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**Money-Back Guarantee
Of Longer Service And
Lower Maintenance Cost**

Castings to your patterns—
any size, shape or section up
to 3,000 lbs. Pattern making,
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BRONZE BAR STOCK**

Round, solid, tubular.
Rough cast or fully machined.
Cored stock, all sizes (by $\frac{1}{2}$ "
steps) from $\frac{1}{2}$ " minimum
core to 26" O.D. 13" lengths
or less. 6 grades of hardness.

Let us quote and make re-
commendations as to alloys.
Simply send blueprints, con-
ditions of operation and other
data.

**THE
AMERICAN CRUCIBLE
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LORAIN, OHIO, U.S.A.

What you can do to make the supply of Stainless Steel
go further



Tell your supplier exactly where you'll use Stainless and how you'll fabricate it

**Keep these points
in mind, too, when
you order Stainless**

Minimize your scrap losses by ordering alternate multiple sizes that will cut to best advantage, and that will allow the mill to utilize the maximum amount of good material.

Indicate, if possible, acceptable alternates in composition, gage, size and finish.

"Second guessing" and "trial-and-error" specification of Stainless Steel are out of the question today with this vital material in such restricted supply. It's up to you to do everything possible to get the right Stainless and then use it right.

Your supplier—no matter who he is—can give you valuable help in this matter. He knows the advantages and the limitations of the various Stainless grades. And, since the supply picture varies from grade to grade, he may be able to suggest an alternate composition that will speed up delivery and give equally good or better results.

Your supplier knows the fabricating characteristics of Stainless grades, too. Consequently, he may be able to suggest slight changes in your fabricating procedure that will speed up or simplify production. In other words, the better he understands your problem the better able he is to give you the Stainless that will do the best job for you with the least trouble and delay.

So give your supplier all the facts. And don't forget to include a definite date for delivery . . . the date when you actually plan to use the material. It will help to distribute supplies as equitably as possible.

AMERICAN STEEL & WIRE COMPANY, CLEVELAND • COLUMBIA STEEL COMPANY, SAN FRANCISCO

NATIONAL TUBE COMPANY, PITTSBURGH • TENNESSEE COAL, IRON & RAILROAD COMPANY, BIRMINGHAM • UNITED STATES STEEL COMPANY, PITTSBURGH

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U·S·S STAINLESS STEEL

SHEETS • STRIP • PLATES • BARS • BILLETS • PIPE • TUBES • WIRE • SPECIAL SECTIONS

1-384

UNITED STATES STEEL

Behind your television screen...



Rubber Television Anode Shield Manufactured by Continental for the Ucinite Company

Continental Rubber gets into the act

In the unseen act behind your television screen, a small cup-shaped rubber shield plays an important role. This shield fits over the anode on the side of the tube. Its function is to "seal in" high voltage current and thus prevent surface discharges that cause picture distortion.

Ordinary rubber compounds, of course, can't fill the bill. This rubber part must have exceptional dielectric properties and unusual stability under sustained heat. It must resist the deteriorating effects of ozone created by electrical discharges. In addition, the rubber shield must be precision molded to insure proper seating against the side of the television tube.

Continental engineers, working closely with Ucinite Company engineers, have met these exacting requirements. This technical cooperation typifies the service in rubber offered by Continental.

When you need better engineered rubber parts, why not enlist the service of specialists in molded and extruded rubber?



LET US SEND YOU THIS CATALOG

This new engineering catalog lists hundreds of standard grommets, bushings, rings and extruded shapes. It will be a valuable addition to your working file. Send for your copy today or . . .

See our Catalog in Sweet's File for Product Designers

MANUFACTURERS SINCE 1903

CONTINENTAL RUBBER WORKS

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Buffalo, N. Y.	Detroit, Mich.	Memphis, Tenn.	St. Louis, Mo.
Chicago, Ill.	Hartford, Conn.	New York, N. Y.	San Francisco, Calif.
Cincinnati, Ohio	Indianapolis, Ind.	Philadelphia, Pa.	Syracuse, N. Y.

(Continued from page 274)

acres, which indicates there is still a large hunting ground. I have also heard estimates made by responsible geologists that we should find within the inland area of the United States some 50 to 60 billion barrels more oil, with other billion barrels underlying the Continental Shelf. During the period since the close of the second world war we have been adding to our reserves approximately 1½ barrels per year for each barrel produced. As long as we continue to add more to our reserves each year than we produce, we can feel that our nation's oil future is on a sound basis.

1 1 1

AMPLE RUBBER FOR MILITARY AND CIVILIAN NEEDS

The world supply of new rubber in 1951 should reach nearly 2,800,000 long tons—by far the greatest in history—unless there is interference with the production and shipment of crude rubber from the Far East, according to John L. Collyer, president of The B. F. Goodrich Company, Akron, Ohio. The total world supply of new rubber would be made up of 1,860,000 tons of crude rubber and 940,000 tons of man-made rubber, of which 880,000 tons would be produced in the United States.

Mr. Collyer pointed out that world consumption of new rubber in 1950 totaled about 2,240,000 tons, which also established a new record.

Barring an all-out war or a substantial reduction in crude rubber arrivals in consuming countries, he said that at least 550,000 tons of crude rubber should be available for additions to industry and Government stocks. Price of crude rubber should decline sharply some time during the year, he added, if conditions in the Far East do not worsen materially and if a global war does not occur.

Based on the assumptions given, he said, "the rubber manufacturing industry should be able to meet all military and essential civilian needs for rubber products in 1951."

1 1 1

PAINT INDUSTRIES SHOW AND CONVENTION, ATLANTIC CITY

The National Paint, Varnish and Lacquer Association will hold its annual convention at Atlantic City October 29, 30 and 31, followed by the annual meeting of the Federation of Paint and Varnish Production Clubs on November 1, 2 and 3. The Paint Industries' Show will open on October 31. The business sessions of the two associations and the Paint Industries Show will be held in Haddon Hall. Convention headquarters will be at the Chalfonte-Haddon Hall.

Further information in regard to the meetings and the paint show may be had by writing to the National Paint, Varnish & Lacquer Assn., Inc., 1500 Rhode Island Ave., N.W., Washington, D. C., or the Federation of Paint and Varnish Production Clubs, 1524 Chestnut Street, Philadelphia, Pa.

(Please turn to page 278)

The cost of life! Westinghouse fluorescent lamps last 7500 hours ...yet cost no more!



Long life? You bet! 2½ years in stores . . . over 3 years in one-shift factories and offices. This means fewer lamp replacements . . . lower maintenance costs! So specify Westinghouse next time you need fluorescent lamps.

**YOU CAN BE SURE...IF IT'S
Westinghouse**

Lamp Division,
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Bloomfield, N. J.

Send me more information on how I can save with
Westinghouse fluorescent lamps.

NAME.....TITLE.....

COMPANY.....

STREET.....

CITY.....ZONE.....STATE.....

**Here's the
Light way
to do it...**



**This tough, Well-Cast
magnesium portable tool
part is typical of how
light you can make your
product. It weighs only
a few ounces.**

Want to lose some weight?

40 years' experience

**ALUMINUM AND MAGNESIUM SAND, SEMI-PERMANENT AND PERMANENT
MOLD CASTINGS, WELL-MADE WOOD AND METAL PATTERNS.**

THE WELLMAN BRONZE & ALUMINUM CO.

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FIRE PROTECTION OUTSIDE CORPORATE LIMITS

For many areas outside the corporate limits of municipalities it is common to depend on the fire department of the adjoining municipality for assistance in fighting large fires says the National Board of Fire Underwriters, New York.

There is a general thought that recompense should be made for this outside response. Several schemes have been adopted, the more common being:

(a) A direct contract between the governmental bodies, providing for a fixed sum per year or per response, or a cost per hour per apparatus responding.

(b) A contract between the municipality and individuals providing for payment per year or for each call.

(c) Purchase of apparatus by those outside, either collectively or through a governmental agency, and furnishing it to the municipality for use inside or outside the limits.

(d) A general understanding that a donation or payment will be made to the company responding.

There are several questions which must be considered by a municipality in connection with this outside response, regardless of whether it is gratuitous, or part of a mutual aid plan, or is paid for. These questions are, briefly:

1. Has a municipality a legal right to use apparatus and men, paid for out of taxes, to protect territory not in the taxing district?

2. Do members responding outside the corporate limits have any legal standing as to right of way, and do they have a right to enter property for the purpose of fighting fires?

3. Are members protected as to compensation, or death claims or pensions?

4. Can members be ordered, or must they volunteer, to do duty outside the corporate limits?

5. Will response be made to an outside call when a fire is in progress in the municipality, and if not, is a penalty payment in order?

6. Is the municipality's protection sufficient to justify allowing apparatus and men to respond to an outside call when, because of blizzards, excessively dry weather or other causes, the probability of a conflagration is increased?

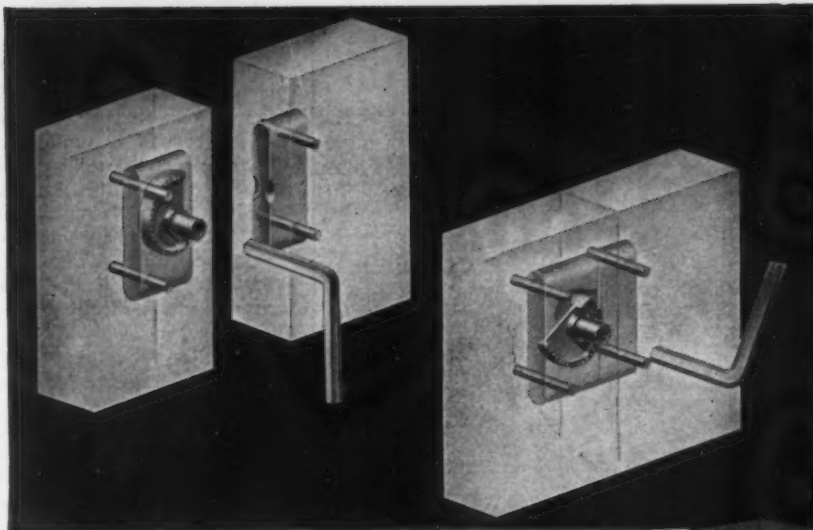
7. What maximum number or length of runs can be permitted without considering outside response as materially reducing local protection in the municipality?

Items 1 to 4 are features which can be cared for by appropriate legislation and by insurance.

The remaining items have a direct bearing on whether this type of protection is of measurable value to the areas receiving response from a municipality, and also are factors which may materially influence the degree of protection within the corporate limits of the aiding municipality.

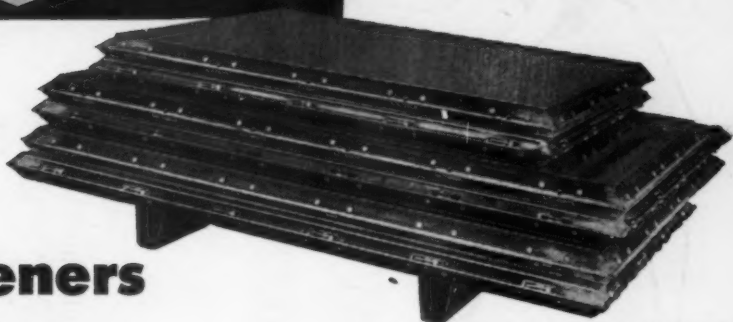
Instances can be found where material saving of property has been possible

(Please turn to page 280)



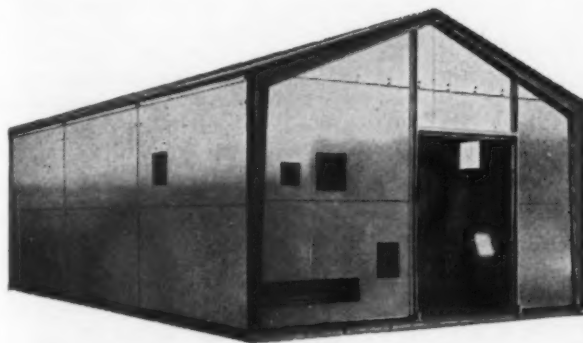
Serrated, tapered cam in male component engages lip of female. Panels are drawn tightly together when cam is turned by hex wrench, screwdriver, or any hand tool.

Lightweight air transport shipping containers, with Roto-Lock Fasteners, knock down quickly for easy return shipment.



PHOTO, COURTESY UNITED STATES PLYWOOD CORPORATION

New Roto-Lock Fasteners Solve Demountable Panel Problems



This portable shelter is made of honeycomb panels developed by the U. S. Plywood Corporation. All panels are attached with Simmons Roto-Lock Fasteners. Portable buildings are also being planned for alert hangars and maintenance hangars for fighter aircraft.

Panels of any material—equipped with the new Simmons Roto-Lock—can be fastened quickly and securely either at right angles or butt joint. No skill is required—just turn the tapered cam to lock, then turn again to unlock. Check these features of Roto-Lock...

1. Roto-Lock exerts sufficient pressure to form airtight and watertight seal when gaskets are used between panels. Carries high-tension loads as well as heavy shear loads—providing a completely structural, insulated connection.
2. Recesses completely into panels—no protruding parts.
3. Will fasten in seriously misaligned conditions—locks in any semi-open position.
4. No springs or delicate mechanical parts which may be affected by severe temperature conditions or field service.

Portable shelters, air freight and cold-storage shipping containers, walk-in coolers, demountable furniture, scaffolding, and many other designs where demountability is desirable, are using this versatile fastener. All are illustrated in our literature. Write for your copy today.

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1743 NORTH BROADWAY, ALBANY 1, N. Y.

QUICK-LOCK...
SPRING-LOCK...
ROTO-LOCK...

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NO. 2 JOHN ST.



In fact, we at American-Fort Pitt Spring have been making coil springs—all kinds, hot or cold wound—spring, summer, fall and winter, for more than sixty years.

Over the years our engineers have worked on almost every conceivable type of spring problem. In many instances their recommendations have helped cut production costs and improve product performance. In every instance the springs we furnish are delivered precisely as specified and in conformity with highest standards.

When you need springs, the No. 1 place to think of is No. 2 John Street, McKees Rocks, Pa., home of the AMERICAN-FORT PITT SPRING Division of H. K. Porter Company, Inc.



AMERICAN-FORT PITT SPRINGS

(Continued from page 278)

with runs of many miles, but it is the opinion of those who have given this much study that little protective value can be expected from automobile fire engines beyond $1\frac{1}{2}$ miles run to closely built areas and 3 miles to scattered sections. Some set this last limit at a 2-mile run. These conditions apply to the building in which the fire originates. Fire apparatus, as much as 10 miles away, may, however, be of value in preventing spread of fire to exposed buildings.

Statistics show that the number of fires and destruction of property are in general in proportion to the population protected. If then this response to outside the corporate limits includes an area of considerable population, it may be expected that the fire companies will be in operation a greater number of times. With each response to an outside fire portions of the municipality will be left with less protection than that normal for its area and population. This condition must of necessity influence the probability hazard of conflagrations.

The protection needed is that which would be adequate for the entire population served, and can be determined by the formula: Number of engine companies = $3.4 + 0.07 P$, where P is the population in thousands of the aiding municipality plus the outside area served. For groups having a total population of less than 50,000 the formula is $0.85 + 0.12 P$.

In addition to the probable need of more apparatus, where an outside area of considerable population is serviced, there must be provided men to man the apparatus; thus the furnishing of apparatus alone, as has been done in a number of cases, does not offset the depletion resulting from an agreement to respond beyond the city or town limits.

From the above discussion it is evident that for suburban and rural areas to receive protection, without reducing the degree of protection in the urban area it is advisable that a special fire district, or county protection, be arranged for.

1 1 1

BOOKLET ON ALUMINIZED STEEL

Aluminized steel—steel with a special coating of aluminum—is discussed in a new booklet published by Armco Steel Corporation.

The illustrated 24-page booklet, "Armco Aluminized Steel", describes the steel's aluminum surface, its heat and corrosion resistance and outstanding heat reflectivity—80% up to 900 F. Photographs and a listing of applications show where manufacturers have used Aluminized in a wide variety of products.

Also included are data on mechanical and forming properties, available sizes and gages, as well as detailed recommendations for welding by various methods, brazing and finishing.

Copies of the booklet can be obtained from Armco Steel Corporation, Middletown, Ohio.

(Please turn to page 282)

**If your
reputation**

thrives on warm air...



Hoover

Electric Motors help it grow...

A furnace blower's good name is like an orchid. It thrives on warm air. In fact a blower must deliver warm comfort all winter, reliably and without fail, at your customer's command. That's why so many blower manufacturers power their products with Hoover Motors!

Hoover Furnace Blower Motors available in ratings of 1/4 HP through 1/2 HP split-phase, and 1/4 HP through 3/4 HP capacitor-start. All feature 1725 RPM speed; all are equipped with an automatic thermo protector, Gits oilers and a resilient base. Built to meet NEMA mounting standards. Approved by Underwriters' Laboratories.

Write today for complete information—on furnace blower motors or on motors built for other purposes.

THE HOOVER COMPANY
Kingston-Conley Division
68 Brook Avenue
North Plainfield, New Jersey



Hoover furnace blower motors give smooth, quiet, dependable service. They're dripproof, equipped with automatic thermal protection, designed for a 40°C. temperature rise. They're built like motors costing far, far more.

They come in different HP ratings, both split-phase and capacitor-start, so there's sure to be a Hoover Motor to fit your furnace blower. For that matter, if you make ANY motor-powered equipment, there's undoubtedly a Hoover Motor to meet your needs and help YOUR reputation grow!



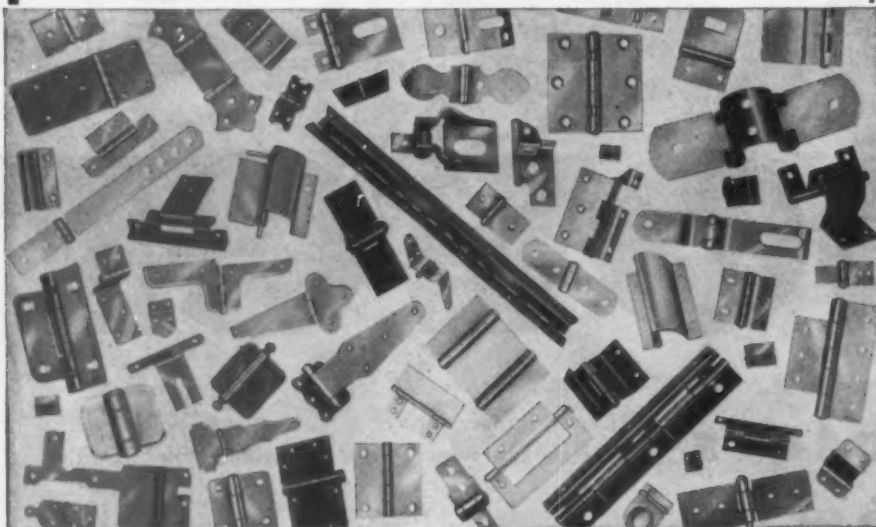
Make **STANLEY** your hinge source!

You just specify the hinge you want—Stanley does the rest, from first sketch to finished product.

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finish best suited to your needs.

As the world's largest producer of hinges, Stanley is geared for efficient production to meet your requirements. Write for full information—not only on special hinges but drawings and stampings as well—now!



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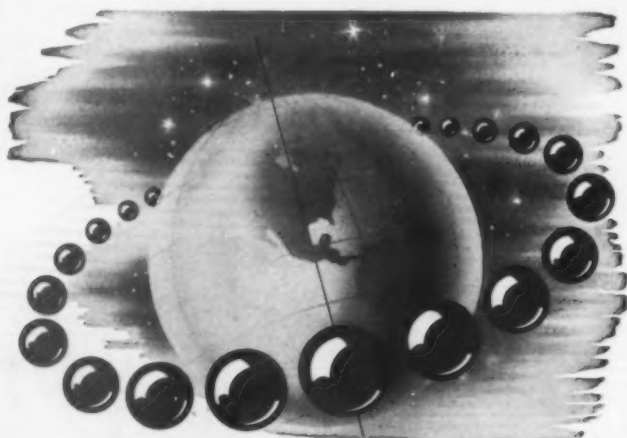
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Around the World it's

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made of

**CHROME STEEL - CARBON
STEEL - STAINLESS STEEL
BRASS - BRONZE AND
MONEL METAL**

*"America's Foremost
Ball Manufacturer"*

HOOVER BALL AND BEARING CO.
Ann Arbor, Michigan

AMPLE SUPPLY OF RUBBER TO MEET CIVILIAN NEEDS

"In March of this year, all of the synthetic rubber plants in the United States should be in operation and as soon as they get up to capacity production they should be turning out synthetic rubber at the rate of a million tons a year," Harvey S. Firestone, Jr., Chairman of The Firestone Tire & Rubber Company, declared in a recent address on "Rubber and Defense".

"Under these circumstances," he said, "it appears that there will be an ample supply of rubber to meet all essential civilian needs without rationing rubber products and, at the same time, to fulfill all our defense requirements."

He warned that "further rubber conservation may become necessary if World War III should break out, if more serious trouble should develop in the rubber producing areas of the Far East, or if greater expansion of our defense needs becomes imperative."

"The industry's production outlook for next year depends upon available supplies of rubber far more than on the usual factors of customer demand and buying power," Mr. Firestone continued. "However, with all synthetic rubber plants operating at capacity and increased orders for military tires and other defense products the rubber industry should operate at a high level in 1951."

Speaking of the nation's synthetic rubber industry, Mr. Firestone told the business and financial leaders that this country "spent \$750,000,000 to gain an economic freedom and national security the value of which is beyond computation. Our synthetic rubber industry is the best paid-up insurance policy that our country has ever had. It guarantees us rubber freedom and forever makes it unnecessary for us to depend solely on the importation of rubber in case of war."

1 1 1

A.S.A. STANDARD FOR INDICATING INSTRUMENTS

The first specifications for portable and laboratory indicating instruments have been approved by the American Standards Association in a revision of the American Standard for Electrical Indicating Instruments.

Users of these instruments can now more easily check them for performance to be expected, and can determine from the listed characteristics and limits the accuracy class for any particular requirement.

This new edition covers alternating and direct current instruments—ammeters, voltmeters, single phase and poly-phase wattmeters, power factor meters, varimeters, and frequency meters.

For the first time in this standard a new "influence" appears. This is the sustained operation influence defined as the change caused by energizing the instrument over extended periods of time over and above the indications of the instrument when first connected to the circuit. Values are assigned for this in-

(Please turn to page 284)



*Why Price Lists on Paint are **ALL WRONG!***

Never try to figure the cost of a maintenance paint job from a price list. You can lose your shirt. Because all that price list gives you is the cost of paint *per gallon* . . . which is very, very misleading.

For instance . . . look at your price lists and you'll find that famous Barreled Sunlight may cost a few more pennies per gallon than many other good paints. But if you compare Barreled Sunlight with *any other paint* . . . *not* by price per gallon but by *actual on-the-wall performance* . . . you'll see what we mean.

Painting costs are determined not by how much less you pay per gallon, but by how much less paint you have to buy and by how much less labor it takes to put it on. That's where Barreled Sunlight shines.

Compare Barreled Sunlight with any other paint . . . by square feet per gallon, for man hours per job, for brightness and years of service . . . and you'll find that Barreled Sunlight will give you a

longer lasting, better looking paint job for less money than any other paint.

Our representative will explain a very simple test that will prove our point for *your* profit. Write and he'll call.

BARRELED SUNLIGHT PAINT CO.
18-C Dudley St., Providence, R. I.



Barreled Sunlight *Paints*

In whitest white or clean, clear, pleasing colors, there's a Barreled Sunlight Paint for every job

IT ALWAYS COSTS MORE NOT TO PAINT!

BUSINESS IN MOTION

To our Colleagues in American Business...

For many years Revere has been saying that "Copper is the metal of invention." Its numerous qualities, such as high electrical and heat conductivity, resistance to corrosion, easy fabrication into even the most complicated shapes, formability by hand with simple tools, make it attractive to designers and inventors, as well as to manufacturers. Now we would like to add that "Copper is the metal of science," because it is so essential to the operation of the most modern scientific devices.

Take the case of a cyclotron being built by a great Western university for special studies of the atom. The construction of this machine offers an unusual example of the use of copper not only in invention and science, but also education. An essential part of the project was the utilization of the university's own personnel, so far as possible, not only in design, but in construction and assembly. A large group of staff members, engineers, research assistants, electronic technicians, and machinists was formed. Included among the personnel were graduates and graduate students in physics.

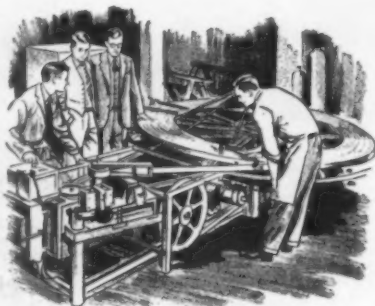
The first major undertaking of the cyclotron group was the winding of the seven miles of Copper Bus Bar, supplied by Revere in soft temper, free from scale, rounded edges, to form the great coils for the electromagnet. The necessary winding machine for this work was built in the university shops, largely of surplus materials. It took four months to complete the coils and test each silver-brazed joint. Another important part of the cyclotron was shaped in the shop out of copper sheet, 4,000 pounds of it; the work on this is a story in itself. The heaviest part naturally is the special alloy steel core, weighing about 200 tons, forged in six pieces. Pole faces were machined parallel to a tolerance of $2\frac{1}{2}$

thousandths of an inch, an excellent record on a piece of steel of such a large diameter (over five feet) as is required for the instrument. It is calculated that the magnetic force of attraction between the two poles will reach 160 tons when the current is flowing through the copper coils. We have spoken of copper's high electrical conductivity; another way to express it is that copper has low electrical resistance. The total resistance of the seven miles of Revere Copper in the coils is only one ohm, or less than a hundredth of the resistance of the glowing tungsten wire in a 100-watt light bulb. Tungsten has high resistance, which is why it becomes white hot; copper has low resistance

and high conductivity, so that it can carry large amounts of power with minimum loss, little heating.

Eventually this cyclotron will add to man's knowledge of the atom. In the meantime, it has been a project of high educational value, and also an economical one; use

of the university's own personnel and facilities cut the cost approximately in half. Revere is glad that it was asked to meet the high specifications drawn up for the copper, but it should also be recognized that many other firms supplied materials, such as the steel company, the makers of insulating paper and plastics, of cement, motor generators, electron tubes, and so on. Demands such as these for high quality demonstrate that American industry can meet challenges. So Revere suggests that the more complex and severe your requirements, no matter what the end product is to be, the more advisable it is for you to draw upon the knowledge and experience of suppliers. They can help not only on something as simple as a shoe, but on complicated machines, like an airplane — or an atom-smasher.



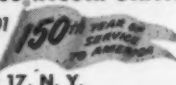
REVERE COPPER AND BRASS INCORPORATED

Founded by Paul Revere in 1801

Executive Offices:

230 Park Avenue, New York 17, N. Y.

SEE "MEET THE PRESS" ON NBC TELEVISION EVERY SUNDAY



(Continued from page 282)

fluence and given in the charts on detailed requirements.

These charts, tabulated for easy reference, cover 33 types of panel, switchboard, and portable equipment. They include: rated accuracy; position influence; external temperature influence; sustained operation influence, maximum; external field influence, maximum; and magnetic platform effect, maximum.

The definitions and classification of materials for switchboard and panel instruments have been completely revised, as well as extended to include portable and laboratory instruments. This new standard has eliminated the errors and ambiguities in the original printing and will be of great value to those who are now using the old edition.

This standard was developed by a committee representing manufacturers, public utilities, testing laboratories, and government departments under the procedures of the American Standards Association.

Copies of the American Standard for Electrical Indicating Instruments, C39.1-1951, may be obtained from the American Standards Association, 70 East 45 Street, New York 17, N. Y., at \$1.60 per copy.



WOOD PRESERVATIVE COMMERCIAL STANDARD

Zinc Naphthenate Wood-Preservative, (spray, brush, dip application), Commercial Standard 165-50, covering physical and chemical characteristics of zinc naphthenate products supplied in either concentrated form or ready-for-use form for the treatment of wood, is now available from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C., at 5c per copy.



GREATER NEW YORK INDUSTRIAL SHOW PLANNED FOR MAY

The Greater New York Industrial Show, an exhibition designed to be of interest to hundreds of different categories of industrial manufacturers, is scheduled to be held May 7-11, in the 71st Regiment Armory, 34th Street and Park Avenue, New York, N. Y. The show is sponsored by the Technical Societies Council of New York, Inc., an affiliation of the New York sections of 17 technical societies with a membership of more than 15,000. The show will present machinery, tools, materials, new processes, new methods and new ideas in the manufacture and fabrication of a great variety of finished products.

According to Wayne A. Howard, Socony-Vacuum Oil Co., chairman of the Policy and Technical Committee for the show, "This is a show where the manufacturer who uses some metals, some chemicals, some machinery, some tools and miscellaneous goods and equipment will see a cross section of his supplies and raw materials." Free technical advisory service will be among the show's features. Headquarters of the show are at 8 West 40th Street, New York, N. Y.

When it pays to use a "SPECIAL"



Whenever you encounter an out-of-the-ordinary bolting job where the use of a standard fastener presents difficulties, or isn't feasible at all, you'll find that it pays to use a "special"—a fastener specially designed to meet a particular bolting requirement. For in nearly every case, "specials" prove far superior to standard bolts, in performance as well as economy.

Making "special" fasteners is a big part of the day's work at Bethlehem's fastener plant at Lebanon, Pa. We turn out "specials" by the thousands at Lebanon. Besides, our fastener engineers are well versed in all phases of bolting, and because of their long experience in this field, they are often able to suggest improvements in design which represent greater advantages for the customer.

In addition to special fasteners, Lebanon Plant also turns out a complete range of standard items—machine bolts, carriage bolts, lag bolts, rivets, spikes, and the like.

There's a good chance that somewhere in your manufacturing operations, a "special" could serve more advantageously than the standard bolt you are now using. We'll be pleased to look into it for you. Just put it up to the nearest Bethlehem sales office, or get in touch with us at Bethlehem, Pa.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

Bethlehem supplies every type of Fastener



Personalities



IN THE NEWS

Ivar G. Blackberg has been appointed Chief Purchasing Agent of Stewart-Warner Electric, the radio and tele-



Ivar G. Blackberg

vision division of Stewart-Warner Corporation. The division has recently moved into a new plant at 1300 No. Kostner Avenue, Chicago, Ill.

Mr. Blackberg has been with the company since 1938, when he was a sales clerk. Subsequently he was connected with production planning and material control. In January, 1949, he was named assistant to the division manager.

David S. Gibson has been appointed Assistant to the Vice President, Purchases and Traffic, of Worthington



David S. Gibson

Pump and Machinery Corporation, Harrison, N. J. J. J. Summersby is Vice President, Purchases and Traffic.

Mr. Gibson studied mechanical engineering at Rutgers University and received his B.S. in 1924. He completed Worthington's student training course that year and for several years thereafter was salesman in the Philadelphia district office. In 1931 he was appointed manager of the industrial resale division, and later was assigned to product and market research. During World War II he was manager of the company's priorities division and later executive secretary of the contract termination committee. Since 1946 he has handled various assignments in the general sales department, as well as studies of general operating procedures.

Bruce D. Henderson has been appointed General Purchasing Agent for Westinghouse Electric Corporation. Wesley H. Lees has been named General Traffic



Bruce D. Henderson

Manager. The appointments were announced by Andrew H. Phelps, Vice President in Charge of Purchasing and Traffic.

Mr. Henderson started as a buyer in the Westinghouse East Pittsburgh works. Later he served successively as assistant buyer, buyer, and assistant purchasing agent for the Small Motor Division at Lima, O. He has been purchasing agent and supervisor of stores at the Meter Division, Newark, N. J., and at the Transformer Division, Sharon, Pa. In 1949 he became manager of purchasing, stores, and shipping at the Transformer Division. Early last year he was named assistant to the vice president in charge of Purchases, Pittsburgh office.

R. X. Stiefvater has been appointed Purchasing Agent for Aluminum Goods Mfg. Co., Manitowoc, Wis. He suc-



R. X. Stiefvater

ceeds Henry W. Vits, who recently resigned.

Mr. Stiefvater has had broad experience in both purchasing and sales work. Some years ago he served as the company's purchasing agent, and since then has been Sales Manager for a contract division of the firm.

Frederic W. Thomas has been appointed Director of Purchases of Joy Manufacturing Company, Pittsburgh, Pa. George R. Fox, formerly head of pur-



Frederic W. Thomas

chasing, has been made assistant to the executive vice-president in charge of the company's plant expansion program.

(Please turn to page 288)



SCIENTIST at Cornell Aeronautical Laboratory gages thin oil film in wind tunnel's oil-cushioned balance system, which measures wind stresses on models to 1/100 of a pound. With the previous oil, rust particles formed,

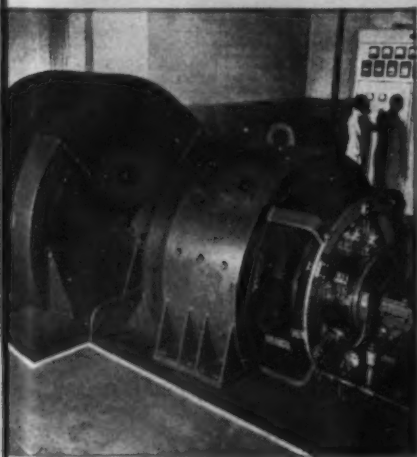
made accurate measurements nearly impossible. Frequent dismantling and cleaning were necessary at a cost of nearly \$1,000 each time. Sunvis 931 Oil restored efficiency of the balance system and eliminated overhauls.

SUNVIS 931 OIL PREVENTS RUST, SPEEDS AIR RESEARCH PROJECT

Cornell Aeronautical Laboratory's transonic wind tunnel, valued at more than \$3 million, determines the ability of planes to withstand winds up to 750 mph. Two years ago difficulties set in. In the delicate hydraulic balance system—where parts literally float on a film of oil—particles of rust were interfering with accurate measurements. Every few months the entire balance system had to be dismantled, thoroughly cleaned, then

reassembled. But there is no problem today. It was solved when a Sun representative recommended Sunvis 931 Oil with "Job Proved" ability to prevent the formation of rust, corrosion, sludges, and gums.

"Job Proved" Sunvis 900 Series Oils are unsurpassed in quality. Under normal operating conditions *they are good for the life of your machinery.* For complete information, call or write your nearest Sun Office.



WINDS UP TO 750 MPH are generated by these two 12,000 hp electric motors directly connected to the main shaft. Sunvis 931 Oil lubricates and protects them, too.



TWO HIGH-SPEED propellers are also lubricated by Sunvis 931 Oil. It remains free-flowing, nonsludging, after more than two years' rigorous service.



TEST PILOT PREPARES for the take-off, confident in the knowledge that scientific laboratory pretesting has minimized the risks he runs.

SUN INDUSTRIAL PRODUCTS

SUN OIL COMPANY, PHILADELPHIA 3, PA. • SUN OIL COMPANY, LTD., TORONTO AND MONTREAL



(Continued from page 286)

Mr. Thomas has a background of 27 years of industrial sales and purchasing experience. Before joining Joy, he was General Manager of Purchases for Worthington Pump and Machinery Corporation. Mr. Thomas is a graduate of



George R. Fox

Stevens Institute of Technology. Mr. Fox has been with the company since 1945. He served as works manager of one of the company's plants and since 1949 had been Director of Purchases. Prior to his affiliation with the company, he was Vice President and General Manager of the Arms-Franklin Corporation.

Charles H. Disch has retired as Vice President and Director of Purchases for Wrought Washer Manufacturing Company, Milwaukee, Wis. Mr. Disch, who had 44 years continuous service with the company, had occupied the post of Vice President and Director of Purchases for the past 25 years.

F. Albert Hayes, Vice President for Purchasing of Bigelow-Sanford Carpet Company, Inc., New York, N. Y., has been named Director of the company's



F. Albert Hayes

recently formed Defense Contracts Division. The division will be responsible for seeking, evaluating, and contracting for defense business in textile manufacturing, machine tool production, engineering development and research.

Ward J. Farwell has been appointed Purchasing Agent for Jones & Laughlin Supply Company, Tulsa, Okla. He succeeds Ernest B. Thornburg, who served as purchasing agent since 1909 for the company and its predecessor, the Frick-Reid Supply Company.

J. J. Milam has been named Purchasing Agent of United States Rubber Company's textile division, with headquarters at Stark Mills, Hogansville, Ga. He will also handle waste sales for the division.

Mr. Milam joined the company in 1940 at Hogansville, handling production scheduling. He was transferred to New York in 1941 and put in charge of sales and production coordination. In 1949 he was appointed assistant to the general sales manager of the textile division.

Arthur E. Minor has been named manager of the purchasing department of the Ottumwa, Iowa, plant of John Morrell & Co. He succeeds the late F. C. Raney. Horace R. McCaughey has been appointed assistant manager. Mr. Minor joined the company in 1933, Mr. McCaughey in 1929.

Edwin S. Ladley has been named Assistant Director of Purchases of Hercules Powder Company. Lawrence J. Finnan, Jr., is Director of Purchases. Mr. Ladley succeeds William L. Hewes who has retired after 41 years of service.



Edwin S. Ladley

Mr. Ladley has been associated with Hercules since 1942. During 1942 and 1943 he worked on priorities details with the purchasing department. In 1944 he became a buyer for the department. Mr. Ladley is president of the Wilmington Industrial Purchasing Agents Association.

Horace L. Brewer has been appointed Director of Purchases for Consumers Power Company, Pontiac, Mich. This is in addition to his duties as Director of Industrial Development, a post he has held since 1949.

Mr. Brewer was Purchasing Agent for the company for a number of years. The announcement of his appointment stated that the firm was capitalizing on his long experience in purchasing during World War II when procurement of materials was a critical problem. Harold T. Belcher will continue as Purchasing Agent and will retain responsibility for the direct operation of the department.

C. V. Martin has been appointed Assistant Director of Purchases in charge of priorities and material expediting for The Davison Chemical Corporation, Baltimore, Md.

Howard G. Golem has been appointed Director of Procurement for Consolidated Vultee Aircraft Corporation, San Diego, Calif. Mr. Golem, who has been chief of material for Convair in San Diego since 1946, will be in charge of both subcontracting and purchasing. H.



Howard G. Golem

N. May, who has served as Purchasing Agent for the San Diego division, has been appointed Chief of Material for the division.

During World War II, Mr. Golem organized and directed the extensive subcontracting program for the company. In 1945, he was appointed assistant to the purchasing director. He has been with Convair for the past 22 years.

Gordon B. Shattuck has been appointed assistant to his father, Arthur E. Shattuck, Vice President and Manager of Supply, of the Strathmore Paper Company, West Springfield. He was formerly superintendent of the West Springfield mills.

F. O. Dutton has been added to the staff of M. R. Denison, Director of Purchases for Bendix Home Appliances-Division Avco Manufacturing Corporation, South



F. O. Dutton

Bend, Ind. Mr. Dutton will devote the major portion of his time to special procurement assignments.

Prior to joining Bendix, Mr. Dutton was Director of Purchases for four E. W. Bliss Company plants. Before his connection with Bliss, he was successively, General Purchasing Agent and Director of Purchases for the Easy Washing Machine Corporation in Syracuse, N. Y. He came to Easy from Blaw-Knox Company, where he served in several executive capacities, including Division Manager.

(Please turn to page 290)



Sheffield

at your Service

Sheffield—first to put toothpaste in tubes, in 1892 — has served packagers for over half a century in producing billions of tubes for—

MEDICINAL ointments—salves—jellies—extracts.

DRUG AND COSMETIC pastes—creams—shaving preparations—deodorants—depilatories.

INDUSTRIAL AND HOUSEHOLD cements—adhesives—compounds—greases—paints—fillers—food pastes, syrups, and creams.

All types of tin, tin-coated, aluminum, lead, and Sheffalloy tubes. Free samples and catalog. Remember, packaging in Sheffield Tubes gives your product a container that is . . . Sturdy • Safe • Sanitary • Smart • Convenient.



HAVE YOU A PRODUCT THAT'S BETTER PACKAGED IN TUBES?

You definitely do—if you make or sell products of soft or creamy consistency. Virtually all except an insignificant minority of such products are now successfully packaged in *Sheffield Process* collapsible tubes.

You definitely do—if bulk and weight are now critical cost factors in your warehousing and shipping—if breakage is high in handling and shipping.

You definitely do—if you want a complete packaging service. Tube filling . . . tube cartoning . . . complete package shipment direct to your markets from our branch offices — at Sheffield, these additional services are yours at minimum expense.

For value all the way, specify *Sheffield Tubes*. It pays to use the best.

THE SHEFFIELD TUBE CORPORATION

HOME OFFICES • NEW LONDON, CONN.

W. K. SHEFFIELD, V. P. CHARLES ARCH T. C. SHEFFIELD
NEW YORK 18, N. Y., 500 5th AVE. CHICAGO 16, ILL., 3132 CANAL ST. LOS ANGELES 38, CAL., 7024 MELROSE AVE.
EXPORT: 500 FIFTH AVE., N. Y. CABLE "DENTIFRICE", NEW YORK



FILTER CLOTH

**Superior service
at lower cost**



THERE'S A ROEBLING METALLIC Filter Cloth woven of the particular metal or alloy, and in just the weave and mesh, that will bring maximum efficiency and economy to your filtering operations. The three weaves shown above have the extra strength required for higher pressures or vacuum. Adaptable for nearly any type of filter, they are smooth-woven and easy to clean...assure free discharge of filtrate, and retain even the finest solids.

Mail coupon today for information about Roebling's wide line of Metallic Filter Cloths.

WOVEN WIRE FABRICS DIVISION

John A. Roebling's Sons Company
Roebling, New Jersey



Woven Wire Fabrics Division
John A. Roebling's Sons Co., Roebling, N. J.
Gentlemen: Please send me full information
about Roebling Metallic Filter Cloth.

Name.....
Company.....
Address.....
City.....State.....

ROEBLING

Frank W. Switzer has succeeded M. O. Scott as Assistant Purchasing Agent of the Anaconda Copper Mining Company, Butte, Mont. Mr. Scott had been with Anaconda for the past 50 years. Mr. Switzer was his assistant for the past five years.

Neal J. Crain has been promoted to Director of Purchases for United Engineering and Foundry Company, Pittsburgh, Pa. John C. Utzig has been appointed Purchasing Agent.



Neal J. Crain

Mr. Crain has been associated with the company since 1914. He has been in purchasing all that time, originally as an invoice clerk, later becoming a buyer. From 1938 until his recent appointment



John C. Utzig

he was Purchasing Agent. Mr. Utzig joined the company in 1923, as a clerk and accountant in the treasury department. He was a buyer in the purchasing department from 1930 until his recent appointment as Purchasing Agent.

William H. Scott has been promoted to Executive Assistant Manager of the purchasing department of Standard Oil Company (Indiana), Chicago, Ill.

Mr. Scott joined Standard in 1929 as a design engineer at its Whiting, Ind. refinery. In 1938 he was transferred from the manufacturing department to become an assistant buyer in the purchasing department of the general office in Chicago. He was advanced to buyer in 1949. Mr. Scott is a mechanical engineering graduate of the University of Iowa.

Frank W. Trevorrow has been named Purchasing Agent of American Ship Building Co., Cleveland, O. He succeeds Frank J. Kunst, who has retired after 51 years' service with the company.

CHICAGO Mounted WHEELS



10 Big Advantages

1. First in the Field—Unexcelled "Know-How"
2. Stronger Mandrels—Special Analysis Steel
3. Wheels Guaranteed to Remain on Mandrels
4. Constant Concentricity for Perfect Balance
5. Widest Variety of Sizes and Shapes
6. Strongest Construction for Longest Life
7. Greater Cutting Freedom—Faster Cutting Action
8. Better, Finer Finishes Positively Assured
9. Job-Engineered to Your Particular Requirements
10. Recommended by Skilled Mechanics and Craftsmen

Free Sample Wheel

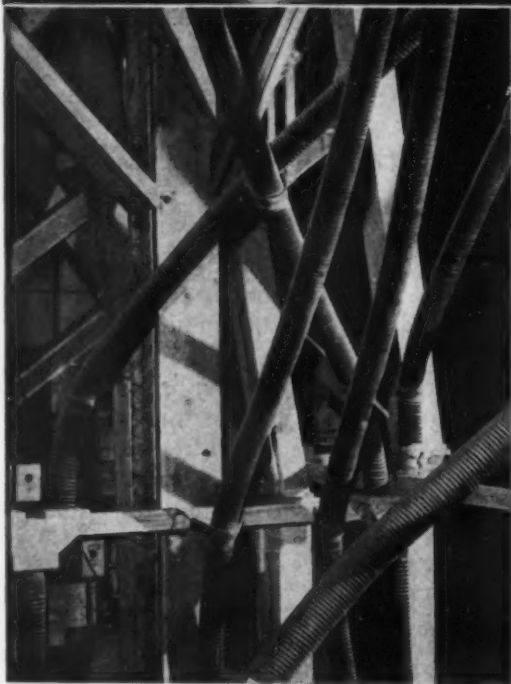
Give details of your operation. We'll supply correct sample. No obligation. Write for Free Catalog.

CHICAGO WHEEL & MFG. CO.

Dept. P • 1101 West Monroe Street
Chicago 7, Illinois

U. S. RAINBOW SANDBLAST HOSE employs compounds which prevent static electricity caused by the blasting materials passing through the hose. Tube is 1/4-inch minimum thickness for top abrasion resistance. Flexible, kink-resistant body.

What's U. S. Rubber doing with Sand and Dust?



U. S. DUST CONVEYING HOSE will withstand the severe action of various abrasive particles conveyed through blower or suction systems. Exceptionally light and flexible. Resistant to fumes and moisture.

"U. S." technicians are constantly developing new types of hose to meet new specifications, new conditions in conveying sand and dust.

When you specify U.S. Rubber Hose, you may be sure that your investment will bring you the maximum return in trouble-free performance, in operating life and in economical service.

The research and design staff of United States Rubber Company is always at your service on hose problems. Write to address below.

PRODUCTS OF

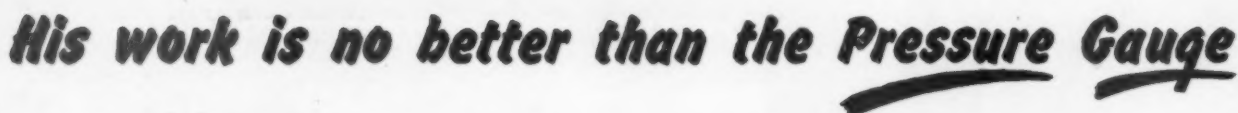
U.S. RUBBER
SERVING THROUGH SCIENCE

UNITED STATES RUBBER COMPANY
MECHANICAL GOODS DIVISION • ROCKEFELLER CENTER, NEW YORK 20, N. Y.

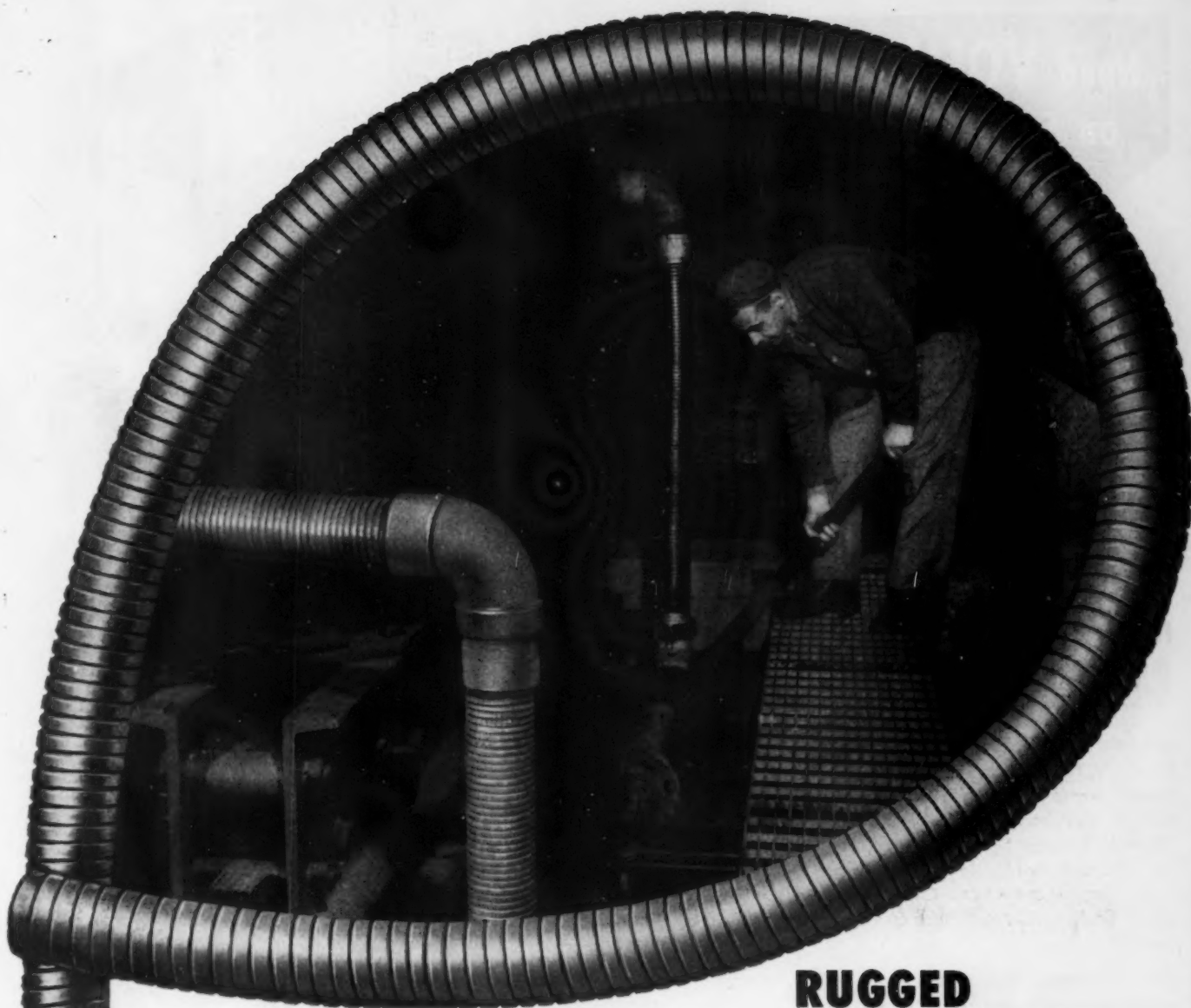
MARCH, 1951

Want Additional Product Information? See Page 19.

291



MARSH GAUGES



RUGGED

FLEXIBILITY FOR EVERY INDUSTRIAL USE

PENFLEX FLEXIBLE METALLIC TUBING

is made to meet every requirement of the manufacturing industry. From $\frac{1}{8}$ " I.D. to 30" I.D. . . . bronze, galvanized steel, stainless steel or copper . . . from an air compressor line to a diesel exhaust, Penflex makes them all for the manufacturing industry.

Coast to coast . . . border to border, Penflex installations prove the value of "Flexineering"—the science of applying flexible tubing to fit the

particular need of the manufacturing industry. When you require tubing or hose that is as tight as a pipe but flexible, safe at high temperatures . . . free from metal fatigue . . . specify Penflex.

Penflex manufactures a complete line of four wall interlocked and seamless welded corrugated flexible tubing . . . plus automatic barrel fillers, rivet passers, accessories and fittings. Write for the folder that will help your production—"Flexineering."

Pennsylvania Flexible Metallic Tubing Company, Inc., 7218 Powers Lane, Philadelphia 42, Pa.
Branch Sales Offices: Boston • New York • Chicago • Houston • Cleveland • Los Angeles

PENFLEX

HEART OF INDUSTRY'S LIFE LINES

Copyright 1951 Penna. Flexible Metallic Tubing Co., Inc.

Need **VOLUME**
on Small Parts
Like
These?



Investigate **MULTI-SWAGE**

Economy Way to Get Volume!

If it's **VOLUME** you need on small tubular metal parts similar to these, be sure to look into Bead Chain's **MULTI-SWAGE** Process. Send the part (up to $\frac{1}{4}$ " dia. and to $1\frac{1}{2}$ " length) and your specs for a quotation. Chances are you'll find a new way to effect important savings.

Much Cheaper Than Solid Pins

Many prominent users of solid pins for electronic and mechanical purposes have cut costs by switching to Multi-Swaged tubular pins . . . without sacrificing strength or accuracy. Often this is possible to accomplish.

Typical Applications —

As terminals, contacts, bearing pins, stop pins, male-female connections, etc., in a wide variety of electronic and mechanical products:—Toys . . . Business Machines . . . Ventilator louvers . . . Radio and Television apparatus . . . Terminal-boards . . . Electric Shavers . . . Phono Pick-ups, etc. For **DATA BULLETIN**, write to



The **BEAD CHAIN** Mfg. Co.
129 Mountain Grove St., Bridgeport 5, Conn.

Manufacturers of **BEAD CHAIN**—the kinkless chain of a thousand uses, for fishing tackle, novelty, plumbing, electrical, jewelry and industrial products.

C. H. Pace, Jr., former Purchasing Engineer of the refrigerator purchasing division, Erie (Pa.) works, has been appointed Supervisor of Purchasing at the Trenton, N. J., works of the General Electric Company.

Charles L. Tate has been appointed General Purchasing Agent of the Toledo Scale Company, Toledo, O. Mr. Tate has been associated with the company's purchasing department since 1942. He was formerly in charge of the purchas-



C. L. Tate

ing of the wide range of castings used in the production of Toledo scales and food machines. Mr. Tate succeeds C. J. Alpaugh who has taken a similar purchasing position with Federal Telephone and Radio Corp., Clifton, N. J.

Herbert Bremner, formerly Purchasing Agent, has been named President of Hodgman Rubber Co., Framingham, Mass. Leona Adams has been appointed Purchasing Agent.

Frank J. Thompson has been appointed Director of Purchases of the L. J. Mueller Furnace Company, Milwaukee, Wis. Prior to joining Mueller, Mr. Thomson



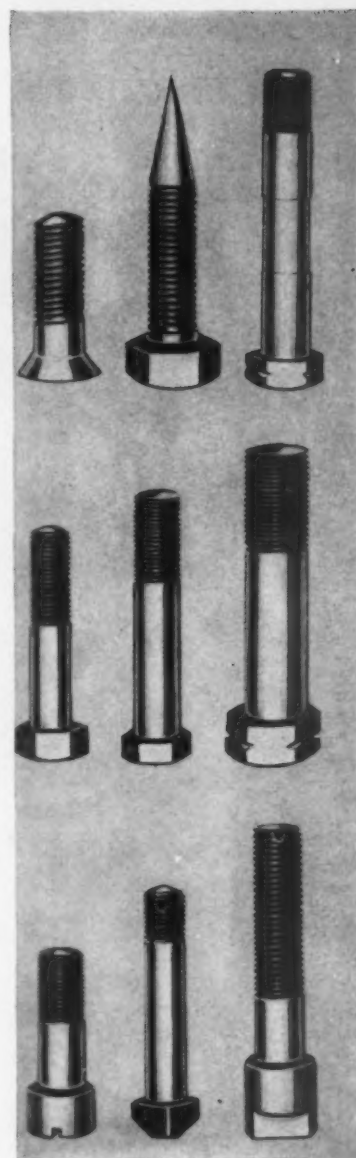
Frank J. Thompson

was associated with the Harnischfeger Corporation where he was electrical, and most recently steel buyer. Before that time he was Purchasing Agent for the Institute of Paper Chemistry, Appleton, Wis.

Lee M. Garber, formerly Assistant Production Manager, has been promoted to Purchasing Agent of the Buch Manufacturing Company, Elizabethtown, Pa. He has been with the company for eight years.

Thomas Foy has been named Purchasing Agent for the American Broadcasting Company, New York, N. Y.

(Please turn to page 296)



WHEN IT'S
Special BOLTS
and *STUDS*

Send your Specifications to

ERIE

37 years' experience in
making special bolts, studs,
nuts for specific job
requirements.

Send your blueprints to



REPRESENTATION IN PRINCIPAL CITIES

Again SEYMOUR PHOSPHOR BRONZE FOR **DEFENSE**



Meeting rigid specifications for combat duty is an old story to Seymour Phosphor Bronze. The same qualities which gave extra service to peace time products now play an important part in national security.

Resistance to corrosion: Seymour Phosphor Bronze, in general, resists the same wide range of corrosive conditions as does pure copper.

Long service life: Containing no zinc, (except in special free machining alloys), Seymour Phosphor Bronze has a minimum tendency toward season-cracking, which is apt to occur in zinc alloys.

Conductivity: Seymour Phosphor Bronze is particularly valuable for current conducting springs in electrical circuits because of its resistance to breakdown under arcing.

General application: Where the combination of high resistance to corrosion, wear and fatigue, exceptional strength and resiliency, and electrical conductivity is needed — specify Seymour Phosphor Bronze.

Nonferrous alloys since 1878
THE SEYMOUR MANUFACTURING COMPANY, SEYMOUR, CONN.

SEYMOUR



**PRESS A BUTTON
AND HERE'S
WHAT
HAPPENS**



● With International Retractable Anvil Staple Machines filled fibre or corrugated cartons are closed from the outside... saving time, space and money. The International line ranges from portable models (above) to large stationary machines which Staple both tops and bottoms simultaneously.

Your inquiry will result in one of our representatives showing you exactly which International model can profitably be worked into your shipping operations.

**INTERNATIONAL
STAPLE & MACHINE
COMPANY**
HAVERTOWN 10,
PENNA.



Anvils penetrate carton.



Staple driven against Anvils.



Anvils retracted, Staple forms neat and perfect clinch.



EST. 1938

W. J. Eckardt has been appointed Purchasing Agent for De Pauw University, Greencastle, Ind. He succeeds D. W. Smythe, who is the new comptroller.

Robert A. Messenger has been appointed Assistant Purchasing Agent for the



Robert A. Messenger

Hilliard Corp., Elmira, N. Y. Mr. Messenger is a graduate of Hamilton College.

Richard D. Hunt has been appointed Assistant Purchasing Agent of Superior



Richard D. Hunt

Coach Corporation, Lima, O. Mr. Hunt, who was previously a buyer, joined the company in 1926.

Leo A. Wise, Purchasing Agent for the American Safety Razor Corporation,



Leo A. Wise

Brooklyn, N. Y., has been appointed chairman of the steel-iron division of the Brooklyn Red Cross 1951 Fund Drive.

Colonel James V. Demarest, USAR, former executive officer of the New York Quartermaster Procurement Agency, New York, N. Y., has been appointed (Please turn to page 298)

**The Wide Range of
CLEVELAND CONTAINERS**

includes many that are ideal for
Spare Parts Packaging
thus simplifying the problem of
protecting parts in handling and in transit.

Cleveland Plugs, Caps and Sleeves protect
threads and parts, in production, shipment
and while in storage.

STRENGTH • RIGIDITY • PROMPT DELIVERIES

The CLEVELAND CONTAINER Co.
4201 BARBERTON AVE. CLEVELAND 2, OHIO
• All-Fibre Cans • Combination Metal and Paper Cans
• Spirally Wound Tubes and Cores for all Purposes

PLANTS AND SALES OFFICES: Cleveland, Detroit, Chicago, Plymouth, Wisc.,
Jewellburg, N. J., Ogdensburg, N. Y. • ABRASIVE DIVISION at Cleveland
SALES OFFICES: Grand Central Terminal Bldg., New York City; Washington
Gas Light Bldg., Washington, D. C.; West Hartford, Conn.; Rochester, N. Y.
Cleveland Container Canada, Ltd., Prescott, Ontario • Offices in Toronto and Montreal





SPEEDER-UPPERS on the production line

In factories, warehouses, mills and on shipping platforms, thousands of these husky materials handlers, powered by Exide Batteries, are upping production, cutting time, saving money.

Where dependability is vital, you'll find Exide Batteries.

Exide Batteries provide motive power for mine haulage units.

Railways use vast numbers of them for car lighting, air-conditioning, Diesel locomotive cranking, signal systems.

Telephone and telegraph companies, radio and television stations, electric light and power plants, steamship and air-transport lines, use thousands of Exide Batteries. They supply power for emergency lighting, fire alarm

systems, cranking engines on off-the-highway equipment. And on millions of cars, trucks, tractors and buses, they daily prove that "When it's an Exide, you START."

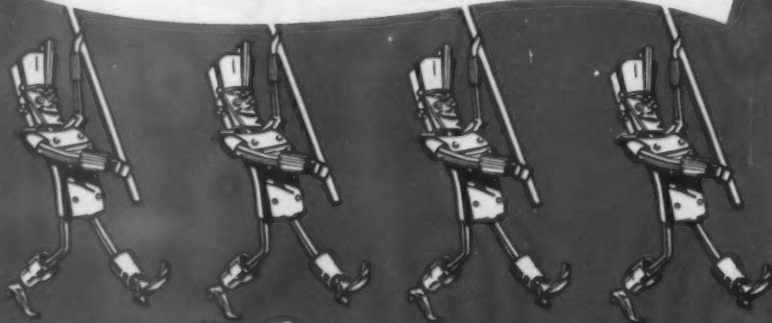
Exide
BATTERIES

"Exide" Reg. Trade-mark U. S. Pat. Off.

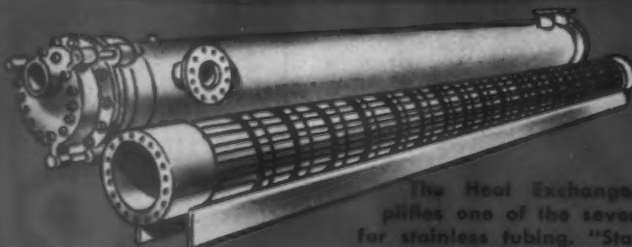
1888...DEPENDABLE BATTERIES FOR 63 YEARS...1951

THE ELECTRIC STORAGE BATTERY COMPANY, Philadelphia 2 • Exide Batteries of Canada, Limited, Toronto

Keep in Step with— RIGID GOVERNMENT TUBING REQUIREMENTS



SPECIFY **"Standard"**
for Welded Stainless Steel Tubing



The Heat Exchanger exemplifies one of the severest uses for stainless tubing. "Standard's" stainless tubing meets this, as well as many other different requirements for strength, and heat and corrosion resistance.

Deal with the Specialist among Specialists

A tubing specialist, like other specialists, knows his trade best.

When you deal with "Standard" you deal with a tubing specialist who manufactures millions of feet of tubing every month from stainless and carbon steel—and for

25 years has been serving all types of industry for mechanical and pressure tubing applications.

If you need stainless tubing, be sure you specify "Standard". It pays to deal with the tubing specialist among specialists.

Stainless Tubing Size and Thickness
3/8" O.D. to 3" O.D.
.028 to .095 wall
Carbon Steel Tubing
1/2" O.D. to 5 1/2" O.D.
.028 to .260 wall



(Continued from page 296)

special consultant to The Quartermaster General of the Army, with offices in the Empire State Building. He will assist The Quartermaster General in the expediting of Quartermaster Corps procurement.

Carl C. Nelson, Director of Purchases for Walker Manufacturing Company, Racine, Wis., has been elected a Vice



Carl C. Nelson

President. Mr. Nelson has been in charge of purchasing for the past 20 years, and is one of the company's original executives.

Robert H. McFarland has been appointed Purchasing Agent of James Lees & Sons Company, Bridgeport, Conn.

FRANK A. JEPSON

Frank A. Jepson, Purchasing Agent for the Acushnet Process Company, New Bedford, Mass., died suddenly on February 4. Mr. Jepson was an energetic and popular executive who was prominent in business and civic affairs, and particularly well known in purchasing circles. Last year he was elected vice-president of the New England Purchasing Agents Association. He was 53.

LEE C. BOCK

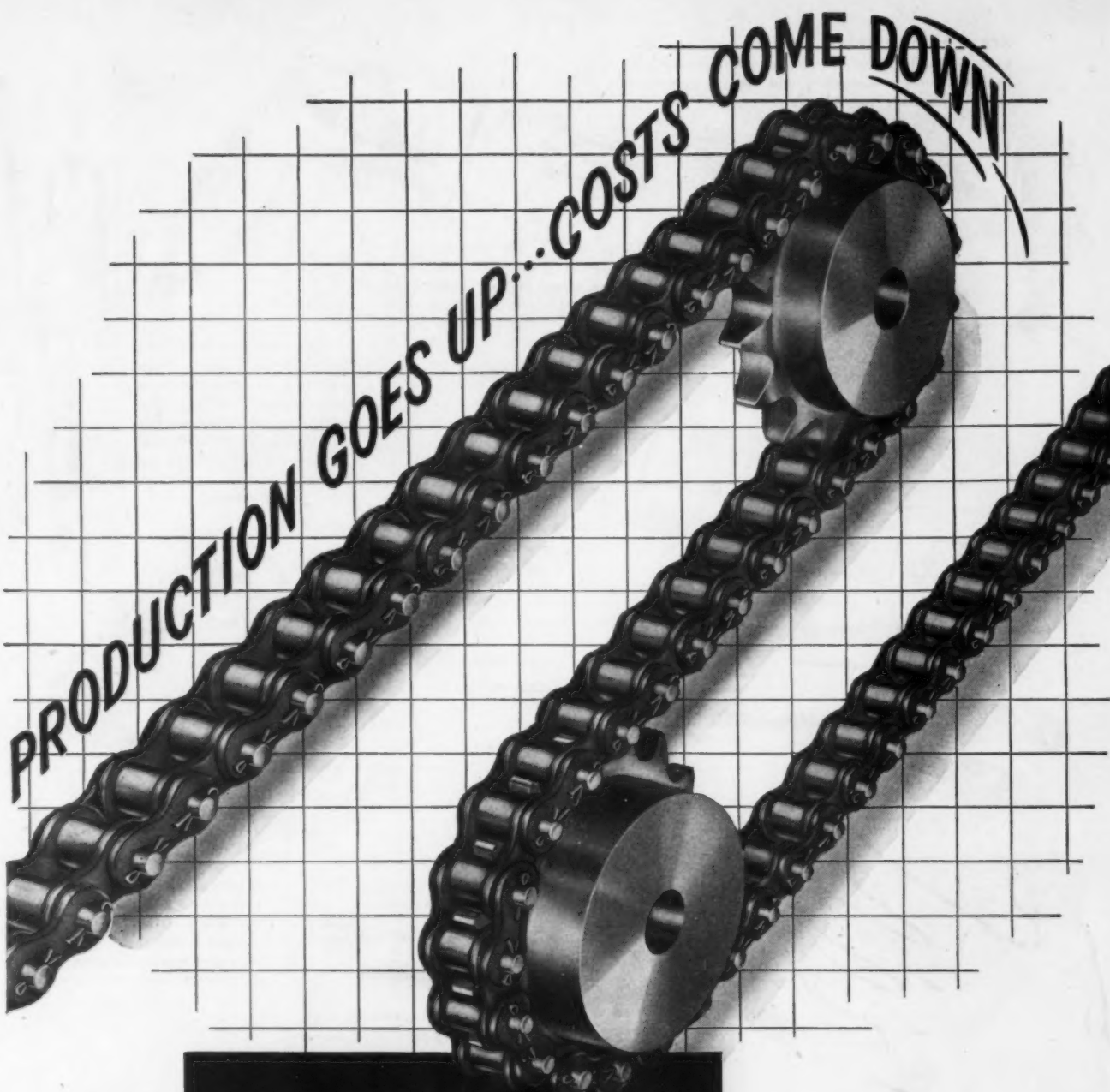
Lee C. Bock, General Purchasing Agent of Gulf Oil Corporation, Pittsburgh, Pa., died suddenly on February 3. He was 58 years old, and had been associated with the company for 42 years. In 1946 Mr. Bock was made General Purchasing Agent for the Gulf companies. In 1949, when the position of Director of Purchases was discontinued, he became head of the purchasing department under his previous title.

J. P. SANGER

Services for John Pomeroy Sanger, 50, Vice President and Director of Purchases for the United States Gypsum Company, were held on Tuesday, February 13, in Northminster Presbyterian Church, Evanston, Ill. with burial in Memorial Park Cemetery. Mr. Sanger died Saturday, February 10, in his home, 2714 Grant Street, Evanston.

Born in Evansville, Indiana, he was graduated from the Illinois Institute of Technology and became associated with the gypsum company immediately afterward, in 1921. He was a past president

(Please turn to page 302)



With- **WHITNEY** CHAIN DRIVES

Service records prove the unusual ability of Whitney Chain Drives to deliver full rated horsepower day in, day out, without failure. To you, as a designer or user of equipment, this means time and dollars saved. Production goes up *and stays up*, while costs come down.

HERE'S WHY — the rolling contact of finely finished, alloy steel chain, meshing into accurate, cut tooth sprockets eliminate power loss because there is no slippage or friction loss. They deliver constant power smoothly and efficiently.

In addition, they absorb shock loads without breakage. And Whitney's alloy steel construction assures exceptionally long operating life . . . a vital point in keeping maintenance costs down.

But that's not all . . . Whitney Chain Drives simplify design problems. They can be operated on long or short centers without tension or excess bearing loads . . . drive shafts clockwise or counter-clockwise, simultaneously. They can be installed or taken off without dismantling shafts or bearings.

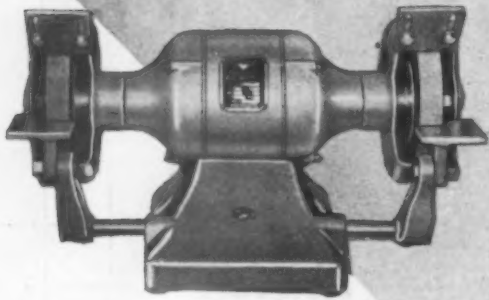
And Remember Whitney Service

In addition to the service facilities of more than 130 Whitney Distributors, Whitney maintains a network of 15 Field Engineering Offices, located throughout the country. The experience gained through more than 50 years of solving drive problems is at your service. From the complete line of Roller, Silent and Conveyor Chains, Whitney Engineers can recommend, without bias, the proper type of drive for your application . . . the chain drive which will give you the best service at lowest cost. Consult your nearest Whitney Field Office or write us direct for catalog and complete information.

WHITNEY CHAIN COMPANY

207 HAMILTON STREET, HARTFORD 2, CONN.

HEAVY DUTY GRINDERS. Super-powered, precision-balanced motors and oversize labyrinth-sealed ball bearings for quick starting and smooth operation under continuous heavy loads. Sizes 1/3" to 1 h.p.



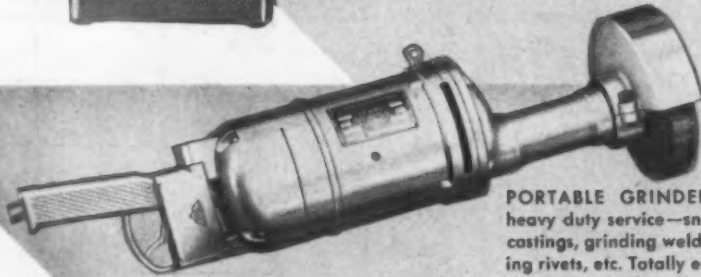
"DYNO-MITE" DRILLS. For high speed production they have no equal in their field. Light weight. Capacities from 1/4" to 3/8". Also other production drills up to 1".



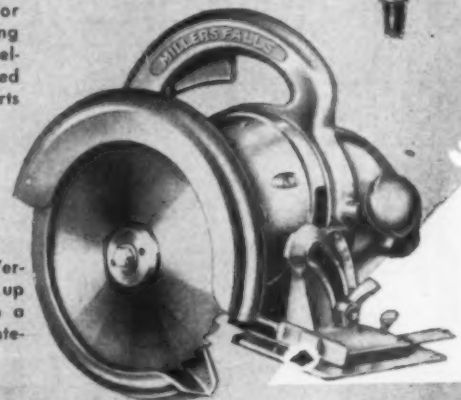
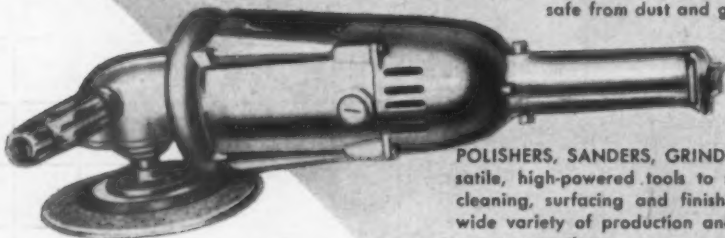
SCREW DRIVERS and NUT RUNNERS with Millers Falls patented, super-sensitive "Adjustomatic" Clutch. Unmatched for delicate assembly work. Also available with new "Positive Clutch" — ideal for operations without uniform torque requirements.



PORTABLE GRINDERS for heavy duty service—snagging castings, grinding welds, leveling rivets, etc. Totally enclosed motors keep all internal parts safe from dust and grit.

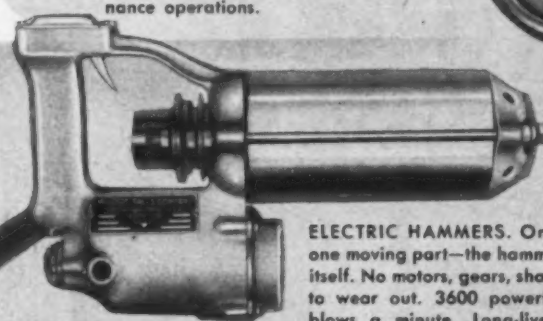


POLISHERS, SANDERS, GRINDERS. Versatile, high-powered tools to speed up cleaning, surfacing and finishing on a wide variety of production and maintenance operations.



ELECTRIC SAWS. 9- and 10-inch heavy-duty models adjustable to 45° angle. Designed for continuous production work in wood or, with special abrasive discs, in metal, concrete and other materials.

ELECTRIC HAMMERS. Only one moving part—the hammer itself. No motors, gears, shafts to wear out. 3600 powerful blows a minute. Long-lived, dependable. In capacities from 5/8" to 2"



HELP YOURSELF to lower costs

MILLERS FALLS TOOLS

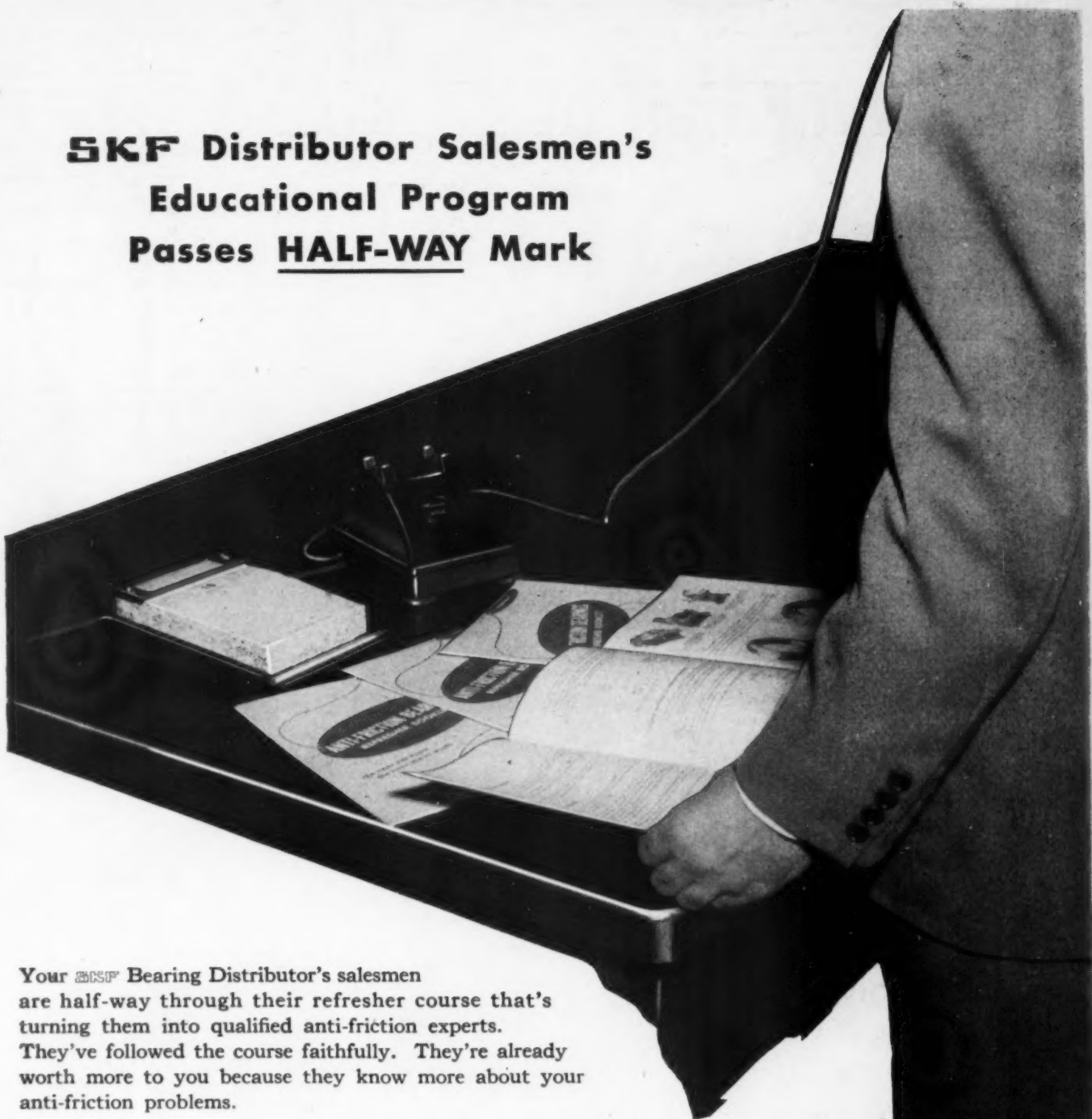
SINCE
1868

The Mark of

Superiority

What makes these tools such favorites with production men? Just try them. They're breaking bottlenecks in thousands of plants . . . producing more work and better work at lower cost wherever they go on the job. They're powerful, dependable, easy-to-use — with all the built-in quality of New England craftsmanship. Sizes and types for practically any job you have in mind. Write for full details — or better yet, ask us to give you a free demonstration on your own work. Millers Falls Company, Greenfield, Mass.

SKF Distributor Salesmen's Educational Program Passes HALF-WAY Mark



Your SKF Bearing Distributor's salesmen are half-way through their refresher course that's turning them into qualified anti-friction experts. They've followed the course faithfully. They're already worth more to you because they know more about your anti-friction problems.

When you need replacement bearings, be sure you consult your SKF Distributor *first*. He's now better qualified than ever to answer your anti-friction questions more intelligently, more efficiently, more economically.



7209
SKF
BALL AND ROLLER BEARINGS

SKF INDUSTRIES, INC., PHILADELPHIA 32, PA.
— manufacturers of SKF and HESS-BRIGHT bearings.

Over Half of America's Top Rated Companies

USE
Speed Sweep

THE BRUSH WITH THE STEEL BACK

Sweeps Cleaner,
Faster, Easier.
Outlasts Ordinary
Brushes 3 to 1

Speed Sweep has become the No. 1 sweeping tool of American industry — used by over 50,000 firms. It is the only brush that is specially designed to do a thorough sweeping job with less effort. It is also the only brush that is constructed to outlast ordinary brushes. Whether you use a few or a lot of brushes, you'll find it pays to use Speed Sweep.

Mail the handy coupon today.



Milwaukee Dustless Brush Co.

530 North 22nd St., Milwaukee 3, Wis.

DATE _____

Send complete facts about Speed Sweep.

NAME _____

ADDRESS _____

CITY _____

ZONE _____

STATE _____

(Continued from page 298)

of the Purchasing Agents Association of Chicago, and was a trustee of Illinois Tech and the Armour Research Foundation. During World War II, he was with the Office of Production Management, and later was an active member of the Hoover Commission.

AMONG THE COMPANIES YOU BUY FROM

Cambridge, Mass.—The H. M. Sawyer & Son Company. Richard W. Harkness has been appointed merchandise manager. A. K. Morley Horton has been named sales manager of the industrial protective clothing division.

Pittsfield, Mass.—General Electric Company. Frederick G. Weigand has been appointed sales manager of alkyl resin products in the Chemical Department.

Philadelphia, Pa.—Atlas Chain and Manufacturing Company. Carl J. Meister has been appointed vice-president and director of sales. Mr. Meister, who has



Carl J. Meister

been general sales manager of Atlas since 1943, will also serve as director of sales for the Atlas Metal Stamping Company.

Cleveland, O.—The Lincoln Electric Company. W. R. Persons has been elected vice-president in charge of sales. He was formerly general sales manager.

Cleveland, O.—Crucible Steel Company of America. Robert C. Kuhn has been appointed assistant district manager of the company's sales office here.

Pittsburgh, Pa.—Allegheny Ludlum Steel Corporation. The following promotions have been made in the sales department: Dr. R. A. Lincoln to manager of sales development and engineering service department; C. R. Mitchell to manager of stainless strip sales, a newly created position; R. S. Robinson to the newly created position of manager of carbon steel sales.

Olympia, Wash.—Georgia-Pacific Plywood and Lumber Company. Stewart W. White has been appointed sales manager of plywood and doors.

(Please turn to page 304)



Thermoid Research Develops New Hose That Saves Time, Money and Storage Space

The latest development of Thermoid research is Versicon—the multi-purpose hose that replaces many special-purpose hose. Versicon is designed for superior performance with virtually every gas and liquid—saves you handling time, money and storage space.

Ask your nearest Thermoid Distributor to supply your needs. Or write Thermoid.

*For durability and flexibility, Versicon is made with neoprene tube, oil-resistant cover and high tensile rayon cords. It is available from $\frac{3}{16}$ " to $2\frac{1}{2}$ " in lengths from 50' to 500' depending on size. Versicon may be used for all air-operated tools, oxygen and acetylene lines. It will handle air, water, gasoline, oil, most insecticides and chemicals, carbonic and other dilute acids, and almost all fluids.

It will pay you to *Specify* Thermoid!

Thermoid Quality Products: Transmission Belting • F.H.P. and Multiple V-Belts • Conveyor Belting • Elevator Belting • Wrapped and Molded Hose • Molded Products • Industrial Brake Linings and Friction Materials.

**Thermoid
Company**

Main Offices and Factory • Trenton, N. J., U. S. A.
Western Offices and Factory • Nephi, Utah, U. S. A.
Industrial Rubber Products • Friction Materials • Oil Field Products



Model FA Wrapping Machine, made by **PACKAGE MACHINERY COMPANY**, Springfield, Mass.

- they say:

**"We recommend
This Lubricant
to Our Customers"**

"We have found LUBRIPLATE Lubricants to be very effective and use them extensively in our machines."

"To assure the proper use of LUBRIPLATE Lubricants for re-lubrication, we place tags on our machines before shipment. Thus the purchasers of those machines know the LUBRIPLATE Product we recommend for each application and where to obtain it."

The Package Machinery Company of Springfield, Massachusetts is among the earliest users of LUBRIPLATE Lubricants. They use them for original lubrications because LUBRIPLATE Lubricants arrest progressive wear and add longer life to moving parts. They recommend them for re-lubrication to preserve the efficiency of the machines, to reduce power costs and minimize service work and parts replacement.



LUBRIPLATE Lubricants are available from the lightest fluids to the heaviest density greases. There is a LUBRIPLATE Product best for your every lubrication need. Write for case histories of the use of LUBRIPLATE in **YOUR** industry.

LUBRIPLATE DIVISION
Fiske Brothers Refining Company
Newark 5, N. J. Toledo 5, Ohio

DEALERS EVERYWHERE . . . CONSULT YOUR CLASSIFIED TELEPHONE BOOK

LUBRIPLATE **THE MODERN LUBRICANT**

Philadelphia, Pa.—Republic Rubber Division, Lee Rubber & Tire Corp. Ray L. Beveridge has been appointed field engineer, and will work in the Philadelphia area.

Victoria, Tex.—N. O. Nelson Company. A branch sales office and warehouse has been opened here, under the management of Ben T. Jordan.

Pittsburgh, Pa.—United States Steel Company. Charles W. Baldwin has been named director and John W. Clinton assistant director of the Coal Chemical Sales Division, Commercial Department, of U. S. Steel. Mr. Baldwin replaces John V. Freeman, who is retiring after 43 years of service.

Jenkintown, Pa.—Standard Pressed Steel Company. J. Whiting Friel has been named vice-president in charge of sales.



J. Whiting Friel

Mr. Friel, who joined the company in 1915, was formerly general sales manager.

New York, N. Y.—Wire Rope Divisions, American Chain & Cable Company, Inc. Robert Pollock has been appointed district sales manager here. He succeeds Walter E. Moore, who has retired.

Los Angeles, Calif.—Eriez Manufacturing Company. C. D. Sutton, Inc., has been named Eriez representative in the Los Angeles area.

Philadelphia, Pa.—The Billings & Spencer Company. Ludwig W. Ritschel has been appointed representative in the Philadelphia territory.

Reading, Pa.—The Carpenter Steel Company. Frederick W. von Raab has been appointed manager of warehouse distribution.

Olympia, Wash.—Georgia-Pacific Plywood & Lumber Company. Harold K. Wilson has been appointed manager of the company's new product department. He will be responsible for the development and application of plywood and plywood products into their many new uses, both industrial and military.

Newark, N. J.—American Swiss File and Tool Company. C. Fred Watkins has been named general sales manager.

(Please turn to page 308)

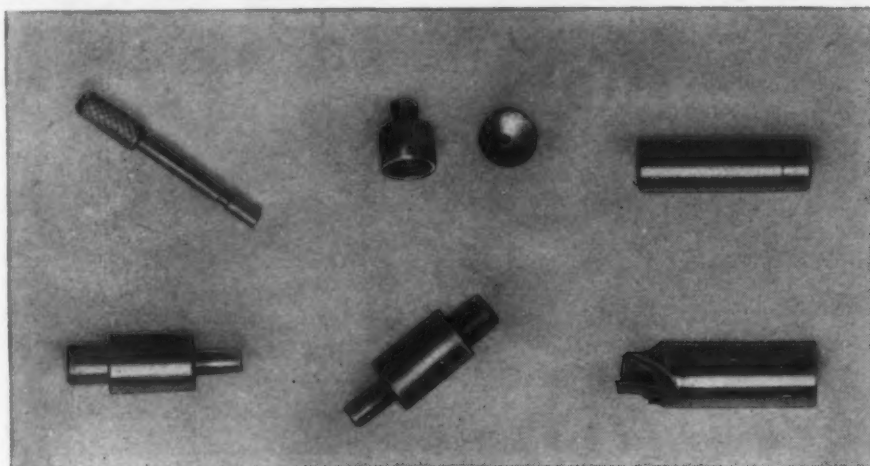


BRIDGEPORT BRASS COMPANY

COPPER ALLOY BULLETIN



MILLS IN BRIDGEPORT, CONN. AND INDIANAPOLIS, IND.—IN CANADA: NORANDA COPPER AND BRASS LIMITED, MONTREAL



Parts made from free turning brass rod. Lower right shows trepanning tool used for adjacent parts.

Savings Often Made Through Restudy of Screw Machine Jobs

Restudy of many screw machine jobs, plus imagination, can often lead to substantial savings by elimination of secondary operations or reduction in cycle time.

One example of this reasoning is seen in the upper left of the illustration.

Method Reversed

The part, made from $\frac{1}{8}$ in. dia. free turning brass rod, is $\frac{15}{16}$ in. long with a $\frac{1}{16}$ in. turned dia. $\frac{5}{8}$ in. long. The stock size knurl is $\frac{5}{16}$ in. long.

Originally the part was box turned, the undercut formed, fed out, knurled and cut off. The $\frac{3}{64}$ in. dia. hole drilled in the knurled end was done as a secondary operation.

It was then decided to do the job in reverse to eliminate the secondary.

The end was first drilled and chamfered. After feeding out the part, the undercut was formed and the $\frac{1}{16}$ in. diameter cut with a swing tool, supporting the part during these operations with a half-round support on the

stock diameter. Next came the knurling and cutoff. The knurling is clean and sharp despite the full overhang and the turned diameter is not distorted. The turned diameter is also more accurate than in the original cycle.

Double-purpose Spot Drill

The small knurled, formed and threaded parts in the center of the illustration are also of free turning brass rod. The $\frac{1}{32}$ in. center hole runs through. To obtain as close concentricity as possible with standard drills, a spotting drill was used, going to a depth sufficient to leave a spot for the small, through drill after the flat-bottom tap drill was run in.

Trepanning Method

Trepanning operations, especially where close tolerances are involved, are often trouble spots despite the ease with which free turning brass can be cut.

Plunging tools are often used in the turret. However, what might be called

a single-lip hollow mill is very satisfactory on small parts.

The parts, as well as the cutter, are shown in the bottom row of the illustration.

The through hole was drilled, the $\frac{1}{8}$ -in. diameter box turned, then the trepanning was done and the inside of the large diameter chamfered.

Combination Tool

The tool was turned in a lathe, hardened and ground. The center clearance was drilled and lapped. Since it was used as a support on the long turned diameter, some burnishing action was both expected and desired.

The depth of cut was $\frac{1}{8}$ in. and the outside wall of the tube was only $\frac{1}{32}$ in. Accuracy was necessary since another part mated with it.

Increase Tool Angles On Medium-Leaded Rod

Screw machine tools designed for free machining brass rod are often used by operators for turning medium leaded rod.

In many cases they will be satisfactory. However, due to the greater ductility of the medium leaded rod (1.8% lead as compared to 3.4% in free turning rod) difficulties through burrs and poor finishes are encountered. Often these troubles can be easily cleared up by increasing slightly the rake and clearance angles and lowering the turning speed. Many times, however, the changed tool angles will be sufficient with no lowering of speed and feeds.

As the chips do not break up as rapidly on medium leaded rod, it is necessary to have rake angles sufficiently great to carry away the chip rather than rolling it back on the stock.

The increased clearance angles will help to prevent rubbing in the more ductile alloy. (6289)

Take a tip from

LELAND A. DOAN

MANAGER LOS ANGELES OFFICE
GREAT WESTERN DIVISION
THE DOW CHEMICAL COMPANY

834 SOUTH SPRING STREET
LOS ANGELES



Leland A. Doan (right), Dow Chemical Company, discusses the merits of one of his company's many products with Mr. A. H. Dekker, Procurement Manager, Turco Products Co., Los Angeles.

Doan of Dow Chemical says, "P. A. is Key Man in the Industrial Picture"...

"The modern Purchasing Executive plays a vital role in the operation of his company. Charged with the responsibility of obtaining the best available materials for both production and research at the lowest possible cost, without sacrificing quality, he is an important member of the management team," says Mr. Leland Doan, Manager of the Los Angeles office, Dow Chemical Company.

"Today's P. A.," points out Mr. Doan, "must be extremely well informed regarding the national

economy, price trends, availability of materials and countless other factors. For this information he must depend, to a large degree, upon his sources of supply. He must demand of suppliers not only uniformity of product and efficient service, but also reliable judgment concerning price trends and availability."

That is why alert suppliers — more than 600 of them last year — use the advertising pages of *Purchasing*, regularly, to help keep the Purchasing Agent well informed. Like Dow Chemical, they recognize the key position the P. A. occupies in today's industrial buying.

They know, too, the importance he places upon his own trade paper. The one national magazine tailored to the exact requirements of the purchasing function, *Purchasing* is read by P. A.s controlling 85% of industry's purchases. No schedule to industry is complete without it! For full details, write to *Purchasing*, 205 East 42nd St., New York 17, N. Y. Offices in Chicago, Cleveland, Dallas, Los Angeles.

PURCHASING

THE NATIONAL MAGAZINE FOR PURCHASING EXECUTIVES



A CONOVER-MAST
PUBLICATION



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ROBERT GAIR COMPANY, INC., 155 EAST 44th STREET, NEW YORK • TORONTO

PAPERBOARD • FOLDING CARTONS • SHIPPING CONTAINERS

MARCH, 1951

Want Additional Product Information? See Page 19.

GAIR multicolor cartons are winning enthusiastic acclaim everywhere with dealers, consumers and manufacturers.

These smartly designed multicolor cartons are solving packaging problems for many manufacturers who are as meticulous about their packaging as they are about their famous products.

Sales, profits and prestige are increased with the SELL-ON-SIGHT appeal of GAIR multicolor cartons.



How to keep production moving FORWARD

by "Shipping in REVERSE!"

IF EVERY SUPPLIER were right across the street, your transportation problems would be over. BUT...

...suppliers are scattered to the four corners of the country... the national emergency has reduced air lift capacity and will reduce it even more... speed and dependability are at a premium.

Hard pressed Purchasing Agents and Traffic Managers know this even better than the people at Emery Air Freight. That is why Emery has instituted a totally *new* type of transportation service... "Shipping in Reverse."

"Shipping in Reverse" means simply this: By just 'phoning the purchase order number and the address of your supplier to your *local* Emery Agent you can automatically augment your own staff by several hundred trained Emery Expeditors, spotted strategically across the Continent.

Alerted by Emery's Direct Wire System, the Emery Expediter in your supplier's town immediately picks up your shipment... personally puts it on the first and fastest plane. Everywhere enroute other Emery Personnel *act as your own personal expeditors* to circumvent transfer delays and keep your shipment moving with maximum *dependable* speed. On arrival, your local Emery Expediter personally delivers the shipment *directly* to your receiving room. Throughout, you do business with one *and only one carrier*, door-to-door!

Get the complete story of this revolutionary advance in transportation service *today!* Emery is on the job 24 hours a day, *every day* of the year. REMEMBER... *the most expensive shipment is the one that arrives too late!*



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Offices in Boston, Buffalo, Chicago, Cincinnati, Cleveland, Dallas, Detroit, Newark, Los Angeles, Milwaukee, Philadelphia, Pittsburgh, St. Louis, San Francisco, Washington, D.C.

Agents in all other major cities and towns in the U.S.A.

La Crosse, Wis.—The Trane Company. E. A. Cline has been appointed sales manager.

Lynn, Mass.—General Electric Company. C. B. House, Jr., and Lee J. Mohler have been appointed sales managers of two newly established product line sections in GE's small and medium motor divisions. They will head, respectively, the a-c motor section and the d-c motor and generator section of the Lynn Motor Sales Division.

Detroit, Mich.—Ross Operating Valve Company. Domenic A. DiTirro has been named to head the company's sales and technical service engineering divisions.

St. Louis, Mo.—Wagner Electric Corporation. Herbert B. Nechemias has been appointed manager of the industrial sales department, succeeding J. S. Smith, who



Herbert B. Nechemias

was recently appointed Director of Purchasing. Mr. Nechemias joined the company in 1938 as a student engineer and spent 12 years in the sales department prior to his promotion.

Owosso, Mich.—Mid-West Abrasive Company. R. J. Foresman has been appointed assistant general sales manager.

Chicago, Ill.—Chase Bag Company. R. J. Stevens has been assigned as special representative of the company's general sales office.

Buffalo, N. Y.—Chase Bag Company. Harrison B. Rue, in charge of the Memphis sales office for the past four years, has been appointed sales manager here.

Cleveland, Ohio—Resinous Products Division, Rohm & Haas Company. Carl B. Bennett has joined the field staff in the Ohio area.

Skokie, Ill.—Marsh Heating Equipment Company, sales affiliate of Jas. P. Marsh Corporation. William Ensign has been promoted to assistant sales manager. He has been with the Marsh organization for several years in a sales capacity.

San Francisco, Calif.—Westinghouse Electric Corporation. W. P. L'Homme-dieu has been appointed assistant Pacific Coast district manager.

(Please turn to page 310)

ALL ROPES look ALIKE... but

IN

Wickwire Rope

TESTING GOES

100 times beyond normal vision

Uniformity of grain size in steel assures longer life and greater reliability in Wickwire Rope.

Right down the line...starting with the melting and refining of our steel ...and continuing through heat treating processes and cold drawing of the wire, we maintain complete control over the grain size of steel used in Wickwire Rope.

This quality control of basic properties is possible only with a company whose operations are fully integrated from the actual making of the steel to the stranding of the finished rope. It's just one more example of how Wickwire goes "beyond specifications" to give you—at market prices—wire rope that is unsurpassed for reliability, safety and longer life.

See your local Wickwire distributor for the right rope for your particular requirements. Wickwire Rope is available in all sizes and constructions, both regular lay and WISSCOLAY Preformed.

*For detailed information on the McQuaid-Ehn test and what it means to you in superior rope performance, write to Wire Rope Sales Office, Wickwire Spencer Steel Division of C. F. & I., Palmer, Mass.

Precision polishing and high powered magnification enable us to go 100 times beyond normal vision in examining Wickwire Rope steel for classification of grain size to McQuaid-Ehn* standards.

WICKWIRE ROPE



A PRODUCT OF THE WICKWIRE SPENCER STEEL DIVISION OF THE COLORADO FUEL AND IRON CORPORATION

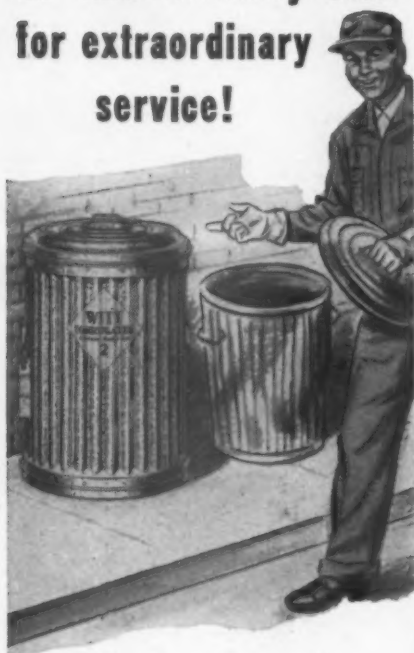
WIRE ROPE SALES OFFICE AND PLANT—Palmer, Mass. EXECUTIVE OFFICE—500 Fifth Avenue, New York 18, N. Y.

SALES OFFICES—Abilene (Tex.) • Boston • Buffalo • Casper • Chattanooga • Chicago • Denver • Detroit • Emlenton (Pa.) • Houston • New York
Odessa (Tex.) • Philadelphia • Phoenix • Salt Lake City • Tulsa

PACIFIC COAST SUBSIDIARY—The California Wire Cloth Corporation, Oakland 6, California

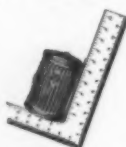
WITT

**an extraordinary CAN
for extraordinary
service!**



Wherever you see crushed or battered CANS you can be certain of one thing—they are *not* WITT CANS. Even after years of hard service the WITT CAN stands out straight and sturdy. A "before and after" comparison of WITT CANS with other brands justifies WITT's quality assuring guarantee—"WITT CANS outlast ordinary CANS 3 to 5 times."

STRAIGHT SIDES provide rugged strength, greater resistance to rough handling, longer wear.



STRAIGHT SIDES assure greater strength, extra resistance to rough handling.
HEAVY GAUGE STEEL provides basic ruggedness, further strengthened by **STRUCTURAL STEEL BANDS** which protect top and bottom of CAN, act as shock absorbers, and **DEEP ROLLING CORRUGATIONS**, the strongest known.
HOT DIP GALVANIZING, a hard process, insures heaviest possible rust proofing, after fabrication.
PINCH-PROOF HANDLES and sturdy **ONE-PIECE TOP** completes the WITT CAN except for the famous **QUALITY ASSURING GUARANTEE**—WITT CANS outlast ordinary CANS 3 to 5 times.

Witt Cans

THE WITT CORNICE COMPANY, Cincinnati 14, O.
"Originators of the Corrugated Can"

New York, N. Y.—Diamond Alkali Company. J. A. Flobeck has been appointed assistant manager of the New York-New England branch sales office located here at 122 East 42nd Street.

Philadelphia, Pa.—Philadelphia Division, Yale & Towne Manufacturing Company. Edwin J. Heimer has been named sales manager of hand lift and motorized hand trucks. He succeeds W. Glen Tipton, who is retiring after 23 years with Yale & Towne. Mr. Heimer was formerly a vice-president of Clapp & Poliak, Inc.

Los Angeles, Calif.—Walter Kidde & Company, Inc. A branch sales office under the direction of Walter G. Beaman, has been opened here at 3327 W. Washington Boulevard.

Pittsburgh, Pa. — The Duff-Norton Manufacturing Company. T. W. Krueger has been appointed assistant general



T. W. Krueger

sales manager. In addition to his new duties he will continue to direct advertising and sales promotion activities.

Akron, O.—Industrial Products Sales Division, The B. F. Goodrich Company. A. Clark Mack, Jr. has been named manager of flat belting, including conveyor, elevator and transmission.

Latrobe, Pa.—Kennametal, Inc. Bennett Burgoon, Jr., has been appointed assistant to the general sales manager, W. D. Turnbull.

Pittsburgh, Pa.—United States Steel Company. David A. Challis, Jr., has been appointed assistant general manager of sales.

Omaha, Neb.—Bemis Bro. Bag Company. T. R. Mangelsdorf has been named sales manager of the Omaha sales division.

Buffalo, N. Y.—Black Mfg. Company. A large new sales and service branch has been opened here at 881 W. Delavan Avenue.

Bronxville, N. Y.—Synthane Corporation. The company's New York district office has been moved from New York city to larger quarters here at 125 Parkway Road.

Refuses No Refuse

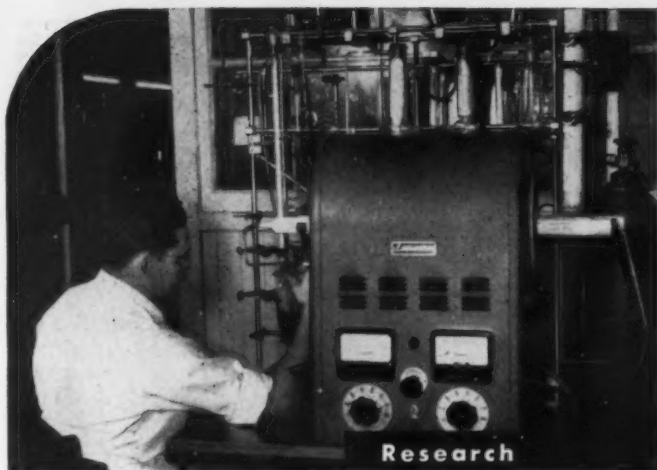


Fuller Floor Brush SAVES TIME By Eliminating Back-Tracking

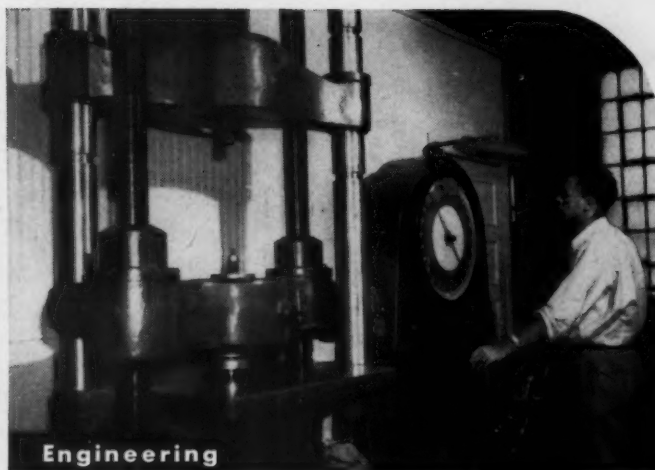
With a Fuller Floor Brush you get *all* the refuse with one stroke. The stiff inner fibers give body to the brush for moving heavy refuse. The outer casing of horsehair simultaneously brushes fine dust. This special blending of materials gives you thorough sweeping with fewer strokes. Cuts floor sweeping time... cuts maintenance costs. For complete specifications, write to...



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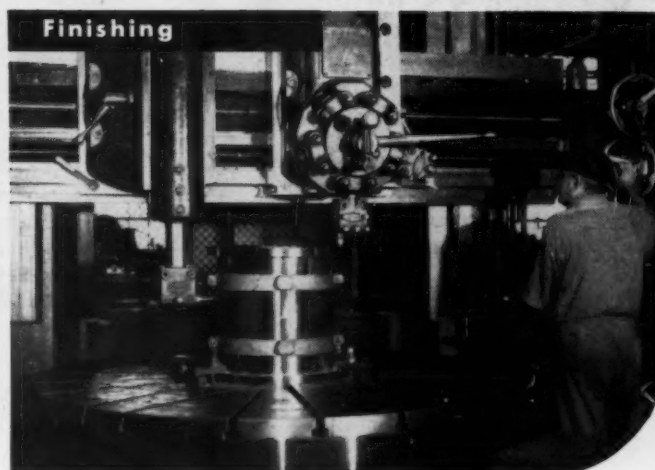
Research



Engineering



Production



Finishing

WHICH

N.B.M. service is most important FOR PRODUCING BETTER BRONZE BEARINGS AND CASTINGS?

The answer is that **ALL FOUR** are equally important... and **ALL FOUR** represent the reasons why more and more users of Non-Ferrous Bearings and Castings become N-B-M Customers.

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The most modern equipment for alloy testing, molding, casting and finishing assures you of finer, more dense, closer-to-size bearings and castings—products that have higher resistance to wear and greater long-range economy.

Yes, this complete N-B-M Service is worthwhile investigating. Call in your nearest N-B-M Representative—he will gladly show you how this service can be geared to serve you with maximum efficiency.



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GEARS
to the exacting
specifications of
the country's largest
engine builders

Perkins is exceptionally well equipped to produce — to customers specifications — all types of gears for aircraft engines or for any other application. In addition to modern machine tools, we have facilities for grinding and shaving teeth, and for heat treating as indicated by specifications. Write for our new bulletin, PERKINS GEARS for full data on our gear engineering facilities.

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 IN ALL MATERIALS, METALLIC AND NON-METALLIC:

bevel gears, ratchets, ground thread worms,
 helical gears, worm gears, spiral gears,
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 of Perkins' Aircraft Engine Gears



PERKINS MACHINE & GEAR company
 WEST SPRINGFIELD, MASSACHUSETTS

**INDUSTRIAL
 DEVELOPMENTS**

Joseph T. Ryerson & Son, Inc., Chicago, Ill., has been appointed exclusive warehouse distributor of Rockrite tubing, manufactured by the Tube Reducing Corporation, Wallington, N. J.

Inland Steel Company, Chicago, Ill., will open a new iron ore mine near Crystal Falls, Mich. It is expected that it will be put in production late in 1952 with an annual output of 200,000 tons.

Gulf Oil Corporation, Pittsburgh, Pa., will build the world's largest single unit for manufacturing ethylene at Port Arthur, Tex. Ethylene is a gas used extensively as a raw material in making chemicals valuable for national defense. The new facilities will produce nearly 2½ billion cubic feet yearly, increasing total U. S. production by approximately 12%.

Granite City Steel Company, Granite City, Ill., has purchased the Missouri-Illinois plant of Koppers Company, Inc., which is contiguous to its own property. Granite City Steel will take over operation of the plant, which consists of one 600-ton and one 500-ton blast furnace, a 49-oven coke plant and all other equipment for production of pig iron.

Celanese Corporation of America will shortly begin construction of a large petro-chemical and cellulose acetate plant in the Edmonton area of Alberta, Canada. A new Celanese affiliate named Canadian Chemical Company Ltd. has been formed to build and operate the plant. It will manufacture many basic organic chemicals never before produced in Canada which have broad applications in defense, war and peace time economies.

Acme Steel Company, Chicago, Ill. has been licensed to manufacture "Cor-Ten", well-known corrosion resistant, high strength, low alloy steel developed by Carnegie-Illinois Steel Corporation. The announcement was made by United States Steel Corporation.

The Carpenter Steel Company, Reading, Pa., will construct a new \$3,000,000 hot-rolling mill which is expected to be completed within a year to a year and a half. The mill will be a combination strip, bar and rod mill designed and engineered to meet the particular requirements of the company's specialty production of tool, stainless, and alloy steels.

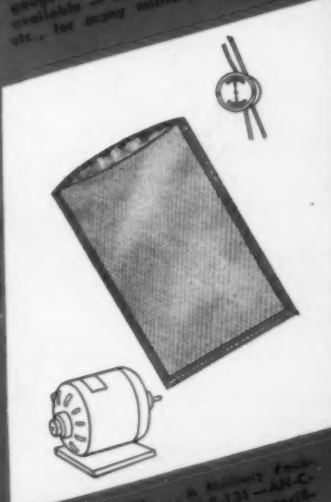
Rockwell Manufacturing Company, Pittsburgh, Pa., has acquired both the Pittsburgh Valve and Fittings Division of the Pitcairn Corporation, and the Pittsburgh Valve and Fittings Corporation, a subsidiary of the Pitcairn Corporation, Barberton, Ohio.

(Please turn to page 314)

If Your Packaging Requires Bags Plan on **MEHL BAGS**



POLYETHYLENE BAGS — The versatile plastic film with unlimited uses — strong — durable. All sizes — all shapes — all colors — all printed. Also available — laminated to foil, paper, etc., for many military packages.



CLOTH-FOIL BAGS — A military package conforming to JAN-P-151 — AN-C-578, MIL-C-60561 or AN-820 specifications. Large or small — with or without pockets — reinforced types. A "MEHL" cloth-foil barrier bag is without an equal . . . more economical.



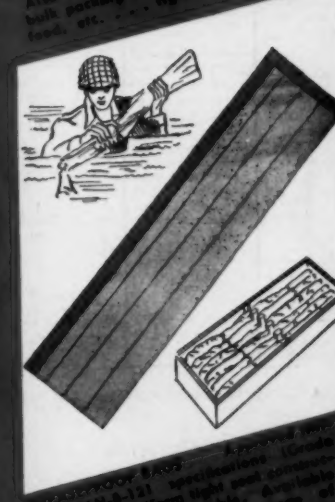
PAPER-FOIL BAG — Another military package to meet JAN-P-117 . . . all types — grades and classes. Non-leaking — easy to handle — heat sealable. Available in any size — any quantity.



WATERPROOF CASE LINERS — To meet Military JAN-P-125 specifications. Types ICI-CI-14-12-M etc.). Protrusion Seal Type with self-sealing closures top and bottom required or preformed styles. Made to individual size and stock specifications . . . prompt delivery.



CELLOPHANE BAGS — Film or paper type construction — printed or plain — heat sealed for a wide variety of civilian items — plus military requirements. Also Cellophane or Paraffin-lined liners for bulk packing of shortening, lard, frozen food, etc. . . . High seal construction.



WATERPROOF BAGS — Approved military JAN-P-121 specifications. Grade A-Grade CI. Uniform tight seal construction — heat-sealing — durable. Available in any bag size. With straps and fasteners for wrapping applications.

These are but a few of the MEHL BAGS serving both the military and civilian industries . . . made from polyethylene plastic . . . aluminum foil . . . cellophane and various papers — alone and in combination . . . providing protective properties of water-proofness, grease-proofness and moisture-proofness. Write — wire — or phone us concerning your protective package problem for commercial use or to meet government specifications.

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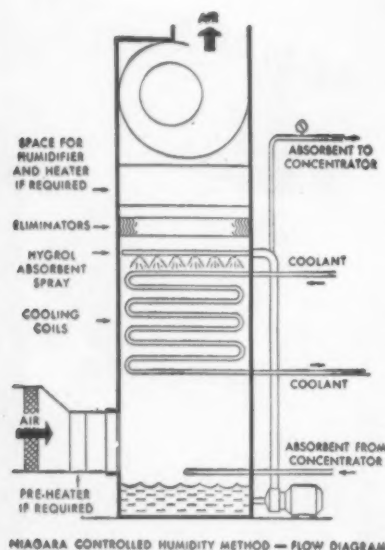
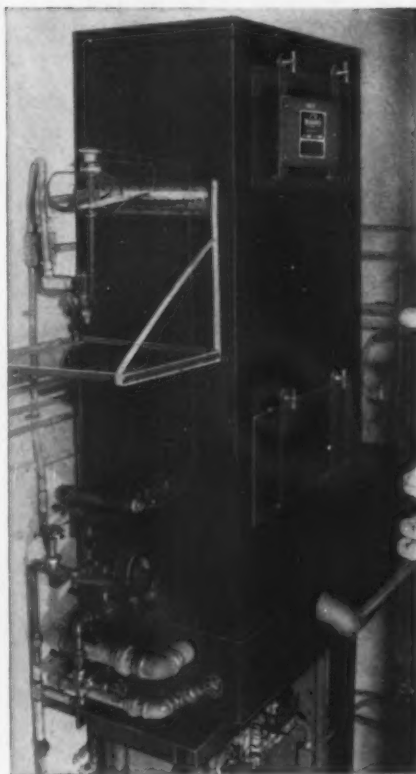
CONVERTERS OF PLASTICS, CELLOPHANE, FOIL AND OTHER FLEXIBLE MATERIALS

New "Controlled Humidity" Method Gives a Better Solution to Air Conditioning Problems

"Hygrol" Absorbent Liquid Dehumidifies Fresh Air Without Refrigeration

NIAGARA Air Conditioners or Dehumidifiers using "Hygrol" liquid absorbent give precise control of air temperature and humidity... at lower operating cost, with large savings in space and with smaller and less expensive equipment, in many applications.

This method dehumidifies the air by passing it through a chamber in which "Hygrol" spray removes its moisture and produces a low dew point. The "Hygrol" solution resulting is continuously and automatically re-concentrated, providing always full capacity in



Write for Bulletin 112

NIAGARA BLOWER COMPANY

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Experienced District Engineers in all Principal Cities

air conditioning and assuring always a constant dehumidifying capacity and a trustworthy, constant condition for your material, apparatus, process or room to be conditioned.

"Hygrol" is a liquid, not a salt solution; it stays pure and non-corrosive; it does not cause maintenance or operating troubles in food plants or in chemical processes.

Investigate this new Niagara Method for "comfort" air conditioning as well as to protect quality in hygroscopic material, or processes or instruments, or to prevent condensation damage to metals, parts or products.

Barrett-Cravens Company, Chicago, Ill., has merged with Crescent Truck Company, Lebanon, Pa., manufacturer of electric industrial trucks and tractors. Crescent will be operated as a division of Barrett-Cravens.

C. A. Norgren Co., Denver, Colo. manufacturer of pneumatic equipment, is constructing a new plant that will provide more than twice the capacity of present facilities.

The Swedlow Plastics Company has opened a manufacturing and fabrication plant at 33 North Meridian Road, Youngstown, Ohio.

R. M. Hollingshead Corporation, Camden, N. J., has merged its Cocoon engineering division with its industrial-aviation division. Whiz Cocoon is a vinyl plastic spray film for coating machines, war materiel, etc.

Peter A. Frasse and Co., Inc., has begun construction on a new 18,000 sq. ft. office and warehouse building in Syracuse, N. Y. The building will permit the



Frassé's New Syracuse Building

consolidation of the entire Frasse Syracuse operation under one roof. It will be devoted to the distribution of alloy, stainless and cold finished carbon steels and tubing.

Worthington Pump and Machinery Corporation, Harrison, N. J., has acquired the land, buildings, and equipment of the National Transit Pump and Machine Co., Oil City, Pa.

The Black & Decker Mfg. Co., Towson, Md., has purchased approximately 180 acres at Hampstead, Md. A branch plant to provide additional facilities for the manufacture of portable electric tools will be erected on the site.

The Cleveland Pneumatic Tool Company, Cleveland, O., has a \$2,500,000 expansion program under way to boost its output of landing gear and other products. Subject to machine tool availability, the program should be completed in July, 1951.

The General Box Company, Chicago, Ill., is planning to construct a new building in Des Plaines, Ill., to house its executive offices and experimental laboratory.

Moore Special Tool Company, Inc., Bridgeport, Conn., is completing a \$250,000 plant expansion program which will shortly increase by 25% its facilities for manufacturing precision machine tools.

(Please turn to page 316)



Why a Set-up Wheel?

For producing certain finishes and shapes today — there is no substitute for set-up wheels. In an increasing number of cases, however, belts and other abrasive products by CARBORUNDUM are coming into use, with marked success, where polishing grain had previously been used exclusively.

Behind this changing production pattern are new machines and techniques — matched at every step by new developments in abrasives and abrasive applications by CARBORUNDUM. Of equal

importance to you, the user of abrasives, is our impartial recommendation of those abrasives best suited to your own job requirements.

Your CARBORUNDUM representative is a trained specialist who will be glad to help you select and apply abrasive products—including those which incorporate the latest developments in the field... whether they be polishing grain, coated or bonded abrasives.

Next time, call in CARBORUNDUM.

Only **CARBORUNDUM**
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makes ALL abrasives to give you the proper ONE

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Steel Collars



HALLOWELL Solid Steel Collars, functionally proportioned throughout . . . precision-machined so faces run perfectly true . . . are beautifully polished all over . . . yet they cost less than common cast iron collars. 3" bore and smaller are made from Solid Bar Stock. To make sure the collar won't shift on the shaft, they are fitted with the famous UNBRAKO Knurled Point Self-Locking Socket Set Screw—the set screw that won't shake loose when once tightened. **HALLOWELL** . . . "buy word" in shaft collars . . . available in a full range of sizes for **IMMEDIATE DELIVERY**.

Write for name and address of your nearest **HALLOWELL** and **UNBRAKO** Industrial Distributors.

OVER 48 YEARS IN BUSINESS.

-SPS- STANDARD PRESSED STEEL CO.
JENKINTOWN 31, PENNSYLVANIA

The Ohio Electric Mfg. Co., Cleveland, O., has purchased all tools, patents, and rights to manufacture the Taylor & Fenn line of drilling machines. Taylor & Fenn Company, Hartford, Conn., is one of the country's pioneer machine tool builders. Tools, dies and fixtures are being transferred to Cleveland, where the equipment will be manufactured.

Olympic Metal Products Company, Inc., Phillipsburg, N. J. has acquired enlarged plant facilities and completed tooling for the manufacture of Mil-T-27 transformer cases. The company's productive capacity has been doubled by the expansion.

1 1 1

NAME CHANGED TO BARRELED SUNLIGHT PAINT CO

The name of the U. S. Gutta Perch Paint Company, Providence, R. I., has been changed to The Barreled Sunlight Paint Company. In making announcement of the change, Wilbur L. Rice, president and treasurer of the company pointed out that "Barreled Sunlight", the registered trade name of the various interior and exterior paints and enamels manufactured by the company, was so generally known that it was felt that it would be far more advantageous to have the company name changed as indicated. It was pointed out that the change was in name only and in no way represents a change in either the ownership or management of the company.

1 1 1

HUGE SYNTHETIC RUBBER PLANT REACTIVATED

Production of man-made rubber is now under way at the giant Institute, West Virginia synthetic rubber plant, according to W. S. Richardson, president of the B. F. Goodrich Chemical Company. The plant has a rated capacity of 90,000 long tons of rubber a year, almost equal to one month's consumption in the United States. The B. F. Goodrich division is also operating for the government a 60,000 ton unit at Port Neches, Texas, which is producing in excess of its rated capacity.

1 1 1

AIM TO DEVELOP BETTER PACKAGING TO REDUCE LOSSES

Reduction of shipping losses and more economical use of packaging materials is the aim of experiments conducted at the Engineer Research and Development Laboratories, Ft. Belvoir, Va. Containers under test are subjected to vibrations, shock and impact of rough handling, arctic and tropic weathering conditions and submersion tests. Another series of tests is aimed to improve legibility of container markings in daylight and darkness, and to increase legible life of markings under exposed storage conditions. Further details available on request to Technical News Letter, Room 2C-765, Pentagon, Washington, D. C.

(Please turn to page 320)

Ready Made

—these bits give you convenience
economy, dependability



- SUPER PANTHER • PANTHER SPECIAL
- ML • LXX • • • • • SUPER DBL • • • • • DBL-2

Pocket Price List NOW READY!

Just send a postal-card request—giving name, position, company, and address. Ask for "A-L Tool Bit Price List," pocket edition. While you're writing, also include the illustrated four-page folder, "A-L Mill Treated High Speed Steel Tool Holder Bits." Yours for the asking.

Write Today
ADDRESS DEPT. P-15

These better tool bits, packed in the famous blue-and-gold boxes, are immediately available in standard sizes from stocks located at 28 convenient points throughout the country.

Ready Made—this means that bits are: (1) already cut to correct lengths, with clearance bevel at both ends; (2) already heat treated uniformly by mill experts; (3) furnished with either regular finish or ground finish; (4) inspected individually for hardness, size, and surface. "Finish-ground" bits are extremely accurate in dimension, entirely free from decarburization and scale, and ready for instant use upon grinding the cutting point to desired shape.

With six popular grades to choose from, you can cover a wide range of cutting needs by specifying these tool

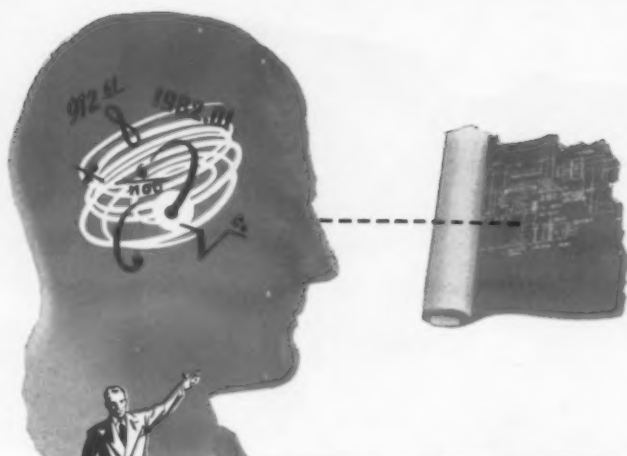
bits. Our informational service will be useful to you in selecting grades. Call A-L, or an A-L distributor.

**ALLEGHENY
LUDLUM**
STEEL CORPORATION
Pittsburgh, Pa.

TOOL STEEL DIVISION: DUNKIRK, N. Y.

Fine Tool Steels
Since 1854





HE'S HEADIN' FOR A HEADACHE

...are you?

Nearly every design engineer has had the same experience—developed a seemingly “perfect” new machine right up to the final blue print stage only to find hidden “bugs” that spell trouble ahead.

Often these “bugs” stem from bearings—their improper or inadequate application, **THAT IS!**

Most engineers, when confronted with anti-friction problems, turn to specialists—engineers who have accumulated years of experience and “know-how” in this one field. Such is the caliber of Aetna’s engineering staff. Thanks to them, leading machinery manufacturers often save months of needless time, effort and expense in product development.

If you’re heading for a headache which sound anti-frictioneering can forestall, consult Aetna. Whether you require new bearings or precision parts “designed from the ground up”, or merely help in selecting standard bearings, Aetna stands ready to solve your problems in the shortest possible time and at the lowest possible cost. Aetna Ball and Roller Bearing Company, 4600 Schubert Avenue, Chicago 39, Illinois.



Standard and Special Ball Thrust Bearings • Angular Contact Ball Bearings • Special Roller Bearings • Ball Retainers • Hardened and Ground Washers • Sleeves • Bushings • Miscellaneous Precision Parts



Lodgepole Pine as produced by the member mills of the Western Pine Association is a top quality wood. It is very close to the Western Pines in weight, strength and texture. It is versatile in its uses—machines to smooth, satiny surfaces, and is easily worked.

Lodgepole Pine is a fine siding material. Its insulation qualities make it ideal to use for sheathing, subflooring, and roof decking. For architectural woodwork and paneling, which demand high dimensional stability, and good paint and stain holding qualities, Lodgepole Pine may be specified and used with confidence.



For more information about Lodgepole Pine send for free illustrated Facts Folder. Address

WESTERN PINE ASSOCIATION
Yeon Building • Portland 4, Oregon

THESE ARE THE WESTERN PINES

THESE ARE THE ASSOCIATED WOODS

WOODS FROM

Idaho White Pine,
Ponderosa Pine, Sugar Pine

Larch, Douglas Fir, White Fir, Engelmann Spruce, Incense Cedar, Red Cedar, Lodgepole Pine.

THE WESTERN PINE REGION



• "you name it...I helped make it!"



Glue for disposable dishware

Why nary a drip as I sip? Glue! Moisture-resistant glue. That seals in ice cream sodas, steaming coffee, milk. In cups, containers and straws. Glue that must be non-toxic, colorless, odorless. That provides a high-speed bond that's as strong as the toughest paper; as flexible as the thinnest. Unusual? Not in the least!

• "you name it...I helped make it!" Look around a drugstore. There isn't a single item that doesn't require at least one, and sometimes eight types of glue in its making, labeling, packaging, shipping. The NATIONAL touch is everywhere. Glue applied through imaginative research and service. To every item of daily life.

STARCHES

National

ADHESIVES

National Starch Products Inc.

Executive Offices: 270 Madison Ave., New York 16, N. Y. • Plants: Dunellen, N. J., Chicago, Indianapolis, San Francisco. • Sales Offices: All principal cities. • Canada: Toronto and Montreal. • England: Slough. • Holland: Veendam.

MARCH, 1951

Want Additional Product Information? See Page 19.

Latest Government Adhesive Specifications!

A 14 page chart... covering a variety of items, from individual combat rations to carload shipments... yours for the asking! 42 specifications tabulated as follows:

SYMBOL (JAN-P-117)

TITLE AND GEN'L DESCRIPTION

Packaging and Packing for Overseas Shipment Bags, Interior Packaging

ADHESIVE APPLICATION

Class a—Greaseproof

Class b—Waterproof

Class c—Greaseproof and Waterproof

Class d—Greaseproof, Waterproof, and Moisture-vaporproof

WE RECOMMEND . . .

Class a—	Class c—
RESYN 45-172	RESYN 45-172
RESYN 3647	RESYN 3647
RESYN 20R3647	RESYN 20R3647
Class b—	Class d—
RESYN 45-172	RESYN 45-172
RESYN 24R3412	RESYN 3647
RESYN 3647	RESYN 20R3647
RESYN 20R3647	

(actual stock should be tested)

If you handle "DO" rated shipments or any type of military packaging, here's a constant and invaluable source of reference. It's authoritative. It's completely up to date. Compiled after years of close cooperation with a variety of Government agencies.

If the job calls for an adhesive, you'll find the approved one here!

Our Technical Service Department is always at your disposal. For special applications... up-to-the-minute specification changes... or general information, contact your nearest NATIONAL ADHESIVES office.

STRETCH

EQUIPMENT DOLLARS

Your equipment investment goes farther when you make Mighty-Midget Pullers standard tools in your plant. On many jobs, a Mighty-Midget can efficiently do the work of hoisting equipment costing up to ten times as much. Yet there is no sacrificing of Coffing quality for low cost. Every Mighty-Midget is built for day-after-day service . . . each is factory tested at 50 percent overload.

RAISE

LABOR EFFICIENCY

The Mighty-Midget is a valuable extra hand around any shop or plant. Weighing only 6½ lb., this handy tool is easily carried from place to place, yet its 500-lb. capacity enables one man to do the lifting, stretching, holding work of many. (1,000-lb. model weighs but 9½-lb.)

LOWER

OPERATING COSTS

Skilled hands go farther, too, for the highly portable Mighty-Midget relieves the burden of countless lifting jobs . . . eliminates calling key men from important production work to lend a hand. Write for Bulletin Z3MP.

with COFFING Mighty-Midget Pullers

Low price—only
\$21.75 for 500-lb.
model; \$31.00 for
1,000-lb. model.

COFFING HOIST COMPANY

Danville, Illinois

Quick-Lift Electric Hoists • Hoist-Alls
• Safety-Pull Ratchet Lever Hoists •
Spur-Geared Hoists • Differential
Chain Hoists • Load Binders •
I-Beam Trolleys

NEW INSTRUMENT FOR ELECTRICAL TESTING OF INSULATING MATERIALS

A new instrument for electrical testing of insulating materials, the Current Limited High-potential Tester, has been announced by the Special Products Division of the General Electric's Apparatus Department.

Developed by the G-E General Engineering and Consulting Laboratory, the instrument is designed to aid electrical manufacturing plants and service shops in testing insulation of electrical components and assemblies such as coils, relays, motors, and appliances. Special applications of the instrument have been made for detecting flaws in surface coatings of paint, lacquer, and sheet materials of a non-conducting nature.



The output current of the tester is limited to a value below the maximum value which an operator can let go if he should accidentally come in contact with the test probes. The low value of output current also assures non-destructive testing.

The tester is enclosed in a metal cabinet with a convenient carrying handle. It operates from a power supply of 105 to 125 volts a-c of 60 cycles. It is available in either single or dual range models. The single range model has an output of 0 to 3200 volts RMS. The dual range model has an 0 to 1600 volt range in addition to the 0 to 3200. For odd frequencies and higher voltages, special models can be made.

G.E. engineers explained that the instrument, because of its current limited feature, is approved for use without the usual interlocks, cages and safety barriers.

1 1 1

NAVAL LABORATORY DEVELOPS ELECTRICAL INSULATIONS

Two improved electrical insulating materials have been developed by the Naval Research Laboratory: One, a mica paper from low-grade ore and scrap at a saving of high-grade stock, will stand intense heat, is stronger, and has greater capacitance than kraft paper; greatest application is expected in electrical condensers. The other is an improved asbestos which forms readily into paper with excellent uniformity and high value as a dielectric; the manufacturing process involves a wetting process in which centrifugal action removes magnetite or iron oxide particles. Details available on request to Technical News Letter, Room 2C-765, Pentagon, Washington, D. C.

(Please turn to page 322)

For Savings



Specify

Darnell CASTERS

If you want maximum floor protection, economy and efficiency Demand Darnell Dependability... Made to give an extra long life of satisfactory service

Free Manual

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Now, more than ever before...

YOU NEED THE PROTECTION OF WIREBOUND BOXES and CRATES

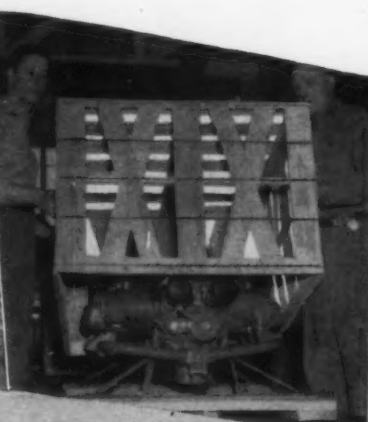
Losses due to container failure have no place in an industrial economy facing material allocations and shortages. That's why you should investigate *Wirebounds*—which combine the strength of steel with thinner wood to bring you *better product protection at lower cost*. Three hundred graduate engineers of the Wire-

bound Institute have been technically trained to design tailor-made *Wirebounds* which assure damage-free product delivery. The value of this container engineering is clearly demonstrated in the following case histories. We will be glad to show you how these benefits apply to *your product*. Use the coupon below.

YOU CAN CUT DAMAGE CLAIMS LIKE THIS:



Upside-down loading of circuit reclosers caused breakage, leakage, sometimes irreparable damage in handling and transit. Since switching to Wirebounds, company reports damage claims have become negligible.



Using Wirebounds designed to "float" 400 lb. precision engines, this manufacturer chalked up a record of 3000 shipments in fifteen months without a single instance of damage in transit due to container failure.



Flexible power saw maker reduced shipping weight from 820 to 775 pounds, cut crating time 30%. Company stacks and handles units four high. Shipping damage due to container failure has been completely eliminated.

**Wirebound
BOXES & CRATES**

choose your course of action...

- ☐ Send me general information... complete descriptive book titled "What to Expect from Wirebounds."
- ☐ Send me specific information... tear sheets of case histories of packing products similar to mine.
- ☐ Give me direct action send an Institute trained sales engineer to show the advantages of Wirebound packing for my own product.

NAME _____		POSITION _____	
FIRM _____			
STREET AND NUMBER _____			
CITY _____		ZONE _____	STATE _____
OUR PRODUCT IS _____		IT WEIGHS _____	

mail now to WIREBOUND BOX MANUFACTURERS ASSOC.
Room 1153—327 South LaSalle Street, Chicago 4, Illinois

Users names on request

A Better Tie at Lower Cost...

with

GERRARD ROUND STEEL STRAPPING

● Gerrard Steel Strapping does a better tying job. It clinches tightly at the corners, grips evenly, holds firm despite rough handling, and delivers packages to their destination in top notch condition.

Shape and size make no difference. Gerrard Round Steel Strapping is adaptable to packages of any shape, size or material . . . to heavy palletizing . . . and to a wide variety of products which may be shipped without containers when bound securely.

The Gerrard method of strapping saves time, labor and money. Gerrard Strapping alone costs, on the average, about 40% less than any other metal reinforcement. And its use will effect other economies in your operations.

Get the complete story from a Gerrard engineer. His advice on your packaging problems is free. And write for a free copy of the *Blue Book of Packaging*.

Gerrard Steel Strapping Company
4713 South Richmond Street
Chicago 32, Illinois



No container is necessary to assure safe delivery of this flexible metal hose. 4-way reinforcement with Gerrard Round Steel Strapping makes a rigid bundle.



The Gerrard Diagonal Tie gives 6-way reinforcement to this fibre carton, increases its strength and rigidity, binds it firmly to pallet for easy handling.



Speed and convenience in handling recommend palletizing rear axle shafts. 3380 lb. load is kept firm and rigid by 4 Gerrard Round Steel Straps. (Photo courtesy International Harvester Company, Industrial Power Division.)



GERRARD ROUND STEEL STRAPPING

UNITED STATES STEEL

BOOKLET ON INS AND OUTS OF DIE CASTING

A new booklet (file drawer size) on die castings—their advantages, how they are made, how they should be designed—has just been prepared and offered free by The Hoover Company, Die Casting Division, North Canton, Ohio.

The book provides basic information and help to anyone who has anything to do with die castings, and it also contains essential technical information needed by designers and engineers.

The introduction tells what die castings are, when and how they should be used, and which kinds of castings (zinc or aluminum) are most suitable for various purposes.

Steps in the manufacture of die castings, from idea on the drawing board to delivery of the finished castings, are told in picture-magazine style.

"Hints for Designing Good Die Castings" includes information on draft, tolerance, wall thickness and core size requirements, tables of chemical and physical specifications for alloys, and a production timetable.

1 1 1

FIND WAY TO ELIMINATE SUGAR PINE BROWN STAIN

Report issued by the research laboratory of the Western Pine Assn., Yeon Building, Portland 4, Ore., indicates that minor alterations in manufacturing routines can virtually eliminate brown stain in Sugar Pine lumber—an occurrence which has caused up to 25% downgrading of Sugar Pine by many mills in Northern California and Southern Oregon. Most important to prevention of brown stain development, it is stated, is rapid handling of green lumber between the time it is sawed and the time it is placed in the dry kiln. It is here that most brown stain, which appears only after seasoning has been completed, apparently gets its start.

1 1 1

TOLERANCE TABLE FOR ROUND CARBON AND ALLOY STEEL MECHANICAL TUBING

The Babcock & Wilcox Tube Company announces the latest edition of a table on tolerances for round seamless carbon and alloy steel mechanical tubing, giving permissible variations in diameter and wall thickness. It refers to cold-drawn-unannealed and finished-annealed tubing in sizes to 8 $\frac{3}{4}$ inches outside diameter, and to hot-finished tubing in sizes to 9 $\frac{3}{4}$ inches outside diameter. This data card, 115C, is available on request to The Babcock & Wilcox Tube Company, Beaver Falls, Pa.

In addition to the seamless carbon and alloy steel mechanical tubing mentioned above, the company, with plants at Beaver Falls, Pa., and Alliance, Ohio, manufactures seamless and welded carbon, alloy and stainless steel tubing for all types of pressure as well as mechanical applications.

(Please turn to page 324)



Salesman's picture of a top P. A.

SALES ENGINEERS, who come in contact with hundreds of different purchasing agents, can generally tell pretty quickly when a P.A. is "tops". How can they tell? Because the top P.A.s often seem like *four* people instead of one!

The top P.A. not only looks at purchasing from the standpoint of a buyer, but also from that of a salesman, an engineer, and an advertising man. Thinking as a salesman, he wants to buy component parts which will help sell his company's product. From an engineer's angle he likes to buy from a manufacturer who provides a complete engineering service. And from the ad man's point of view, he is interested in increasing the saleability of his company's product through the public acceptance of the parts he buys.

Quality, service and public acceptance are the biggest part of the value you receive with any purchase. Singly or together, they far outweigh price in importance. To put it simply . . .

$$\text{Value} = \frac{\text{quality} + \text{service} + \text{public acceptance}}{\text{price}}$$

When you buy Timken® tapered roller bearings, you're sure of top quality, highly experienced engineering help and the greatest public acceptance.

They're your best buy in tapered roller bearings—by any formula. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

TIMKEN
TRADE-MARK REG. U. S. PAT. OFF.
TAPERED ROLLER BEARINGS



NOT JUST A BALL NOT JUST A ROLLER THE TIMKEN TAPERED ROLLER BEARING TAKES RADIAL AND THRUST LOADS OR ANY COMBINATION

MARCH, 1951

Want Additional Product Information? See Page 19.

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P. A. Notes:



1 OUT OF 3 ARE INSPECTORS. The Timken Company takes no chances with quality. On top of using every known control method, we further insure quality by having one person out of every three in the bearing plant devote full time to inspection.



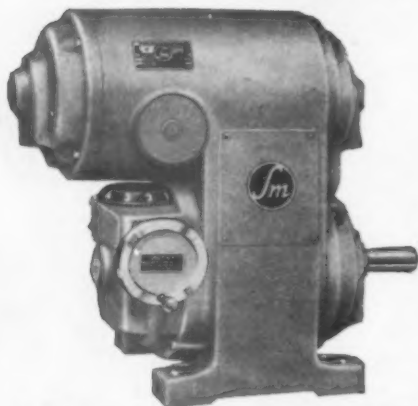
BIG LIFT. Nowhere else can your engineers get the data contained in the Timken Engineering Journal—one of the extra services you get from the Timken Company. Its 529 pages contain engineering diagrams, specifications, other technical bearing data.

LITTLE LABEL THAT SAYS A LOT. This label which appears on products of more than 1000 manufacturers tells a big story of extra value to every prospect. Throughout industry Timken bearings are first in public acceptance!



power modernization

Even a brand new motor
may be obsolete . . .



Ask for your copy of pictorial bulletin
No. A-70 showing Sterling Electric Power
Drives Turning The Wheels of Industry.



STERLING SPEED-TROL

. . . Gives You Variable
Speed Control Necessary For:

- **PROCESS CONTROL OF:** Temperature—viscosity—level—pressure—flow—etc.
- **TIME CONTROL OF:** Baking—drying—heating—cooking—pasteurizing—soaking—chemical action—etc.
- **EQUIPMENT ADAPTATION TO:** Load variation—sequence synchronization. Size—tension—hardness or shape of materials to be processed—machined—conveyed—blended—mixed—etc.
- **VARIATIONS IN:** Quality—quantity—operators' abilities—etc.

STERLING ELECTRIC MOTORS

Plants: New York 51, N. Y.; Los Angeles 22, California; Hamilton, Canada; Santiago, Chile.
Offices and distributors in all principal cities.



DROP FORGINGS

where **HIGH STRENGTH** is essential

RITCO Bright Finish Forgings are a wise choice. RITCO Forgings are smooth, dimensionally accurate, and free of flash—they're supplied in steel and non-ferrous metals in weights from ¼ lb. to 15 lbs. Also available: Special Bolts, Studs, and Nuts • Grinding • Roll Threading • Heat Treating.

Send blueprints and specifications for free estimates. RHODE ISLAND TOOL COMPANY, 148 West River Street, Providence 1, R. I.



Exclusive New England Representative
for Cleveland Cap Screws.

SERVING AMERICAN INDUSTRY SINCE 1834

N.P.A. News

(Continued from page 268)

Controlled Materials Plan

Describing the operation of the Controlled Materials Plan which he headed During World War II, at meeting of Warm Air Industry A. C., Walter C. Skuce, Staff Assistant to the NPA Administrator, said that he is organizing a staff to develop a similar plan.

He also said that NPA is giving serious consideration to action which would provide assistance to industry in obtaining materials for maintenance, repair and operations and channel materials to those engaged in defense-supporting manufacture, which is not now covered by priority ratings.

State and Local Government Purchasing

Problems facing state and local governments in procuring essential materials were discussed at meeting of the Executive Committee of the National Association of State Purchasing Officials with officials of the NPA.

State governments are beginning to feel the effects of the shortage of some materials, spokesmen for the association said, particularly in procuring radio tubes for police cars, equipment for hospitals and penal institutions, and materials for certain construction.

They pointed out that some of their difficulty stemmed from confusion among their suppliers regarding the "DO" defense rated order priority system. Many suppliers, they said, refuse to fill orders without a "DO" rating.

NPA officials explained that the "DO" rating system was established to assure that defense needs are met, and that the system applies only to defense procurement.

In order to assure that materials are available for essential state and local government programs, the state officials recommended: (1) establishment of a secondary priorities program. (2) Establishment of central office in Washington where state and local government can obtain information and answers to their problems involving all Federal agencies, with similar arrangement at the state level where Federal agencies could obtain information on state governments. (3) Organization of an NPA Advisory Committee composed of state, county and city purchasing agents and budgets officers.

Appointments

Manly Fleischmann, general counsel of NPA, succeeds Wm. H. Harrison as Acting Administrator of the NPA, the latter having been appointed Administrator of the Defense Production Administration.

Tin, Lead & Zinc Divn., Whitman W. Hopton, assistant to the president of the Matthiessen & Hegeler Zinc Co., La Salle, Ill., has been named Director of the Tin, Lead and Zinc Division of NPA.

(Please turn to page 326)

ATLANTA-WICHITA

YOUR NEARBY KAISER ALUMINUM DISTRIBUTOR IS LISTED HERE:

ATLANTA, Georgia Morrison-Drebnier Steel Co., Inc. Alpine 4885 82-84 Milton Avenue	MINNEAPOLIS, Minnesota Korhmel, Halfon & Preiss Steel Co. Gladstone 5943 3225 Como S.E.
BALTIMORE, Maryland Hill-Chase Steel Company of Maryland. Peabody 7300 6311 Erdman Avenue	NEW ORLEANS, Louisiana Orleans Steel Products Co., Inc. Raymond 2116 1019-1025 Bienville Street
Asheboro, N. C. Phone 8849	NEW YORK, Metropolitan Area A. R. Purdy Co., Inc., Rutherford 2-8100 Page Avenue & Orient Way, Lyndhurst, New Jersey
Richmond, Va. Phone 7-4573	Lyndhurst: Chelsea 3-4453
BEAUMONT, Texas Standard Brass & Mfg. Co., 705 Milam St. Phone 4-2641	New York: Humboldt 2-5566
CHICAGO, Metropolitan Area Korhmel, Halfon & Preiss Steel Co. Ambassador 2-6700 2424 Oakton Street, Evanston, Illinois	Newark: Glencourt 1-1680
CINCINNATI, Ohio Morrison-Drebnier Steel Co., Inc. Wabash 4480, 4481 1074-1084 Summer Street	OAKLAND, California Gilmore Steel & Supply Company. Glencourt 1-1680 1960 Cypress
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DALLAS, Texas Delta Metals, Division of Delta Distributors, Inc. Hunter 7446 3201 Oak Lane	ORLANDO, Florida Profile Supply Company. Phone 7124 P. O. Box 2049, 1601 Atlantic Avenue
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DETROIT, Michigan Coughlin Distributing Company. Hogarth 3858 9999 Broadstreet	Allentown: Allentown 28077
Copper & Brass Sales, Inc. Lorain 7-3380 3000 East Woodbridge	York: Phone 8-5331
HONOLULU, T. H. Permanente Cement Co., Pier 32, P. O. Box 79. Phone 5-2541	PHOENIX, Arizona Arizona Hardware Co., Inc. Phone 5-9377 First & Jackson Streets
HOUSTON, Texas Standard Brass & Mfg. Co., 2020 Franklin Ave. Preston 1123	PORT ARTHUR, Texas Standard Brass & Mfg. Co., KCS & Fourth St. Phone 5-9377
INDIANAPOLIS, Indiana F. H. Langenkamp Company, 229 East South St. Riley 9311	PORTLAND, Oregon Eagle Metals Company, 2336 N. Randolph. Tuxedo 5201
KANSAS CITY, Missouri Industrial Metals, Inc., 410 Southwest Boulevard. Victor 1041	SAN FRANCISCO, California Gilmore Steel & Supply Company. Klondike 2-0511 840 Brannan Street
LOS ANGELES, California Eureka Metal Supply Company. Lucas 0281 551 East Macy Street	SEATTLE, Washington Eagle Metals Company, 4755 First Avenue South. Lander 9974
Earle M. Jorgensen Company. Adams 6133 10650 South Alameda	SHREVEPORT, Louisiana Standard Brass & Mfg. Co., 1557 Texas Ave. Phone 2-9483
Reliance Steel Company, 2068 East 37th Street.	SPOKANE, Washington Eagle Metals Company, East 320 Trent Ave. Madison 2419
MILWAUKEE, Wisconsin KHP Milwaukee Steel Company. Evergreen 4-6000 4600 West Mitchell Street	WICHITA, Kansas General Metals Mfg. Co., Inc. Phone 7-1208, 7-1209 218-220 South Wichita

THERE'S A NUMBER HERE YOU SHOULD MEMORIZE

Do you find it hard to get certain alloys and sizes of aluminum? If so, your nearby, *helpful* Kaiser Aluminum Distributor is a good man to keep in touch with.

He's one of the nation's leading materials suppliers. He *knows* the aluminum industry... and he's backed by the fully integrated resources of Kaiser Aluminum & Chemical Corporation.

That doesn't mean your Kaiser Aluminum Distributor can always meet your requirements, but it does mean

he represents your best bet today!

So memorize the telephone number of your nearby Kaiser Aluminum Distributor! It's listed on the telephone page above.

Kaiser Aluminum

KAISER ALUMINUM & CHEMICAL SALES, INC., KAISER BLDG., OAKLAND, CALIF. • OFFICES IN MAJOR CITIES

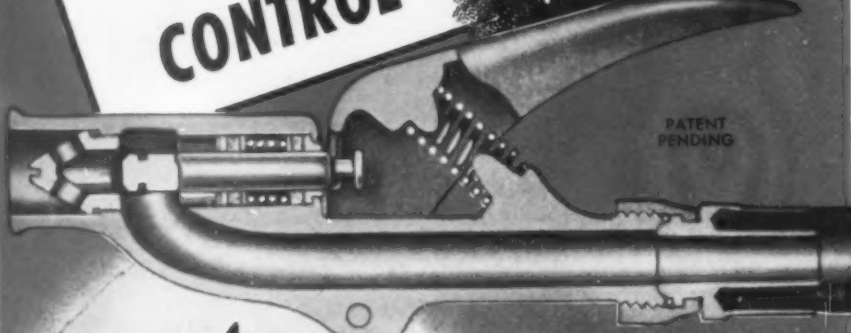
MARCH, 1951

Want Additional Product Information? See Page 19.

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**FASTER...
...MORE
EFFECTIVE
FIRE
CONTROL**

**WITH THE
ANSUL
Stream
Pattern**



...plus
**BETTER
HEAT-SHIELD
PROTECTION**

Exclusive Features

- Water-tight construction.
- Provides a modified cone-shaped stream pattern without hole in the center of the stream.
- Each nozzle gas pressure tested after assembly.
- Special spring loaded packing to insure lasting water-tightness.
- Designed for use by inexperienced operators.
- Low velocity, more effective stream of dry chemical.



ANSUL
CHEMICAL COMPANY
FIRE EXTINGUISHER DIVISION
MARINETTE • WISCONSIN

DISTRIBUTORS
IN ALL PRINCIPAL CITIES IN THE
U.S.A., CANADA AND OTHER COUNTRIES

Why Advertise the Nozzle!

. . . . because the nozzle on your ANSUL Dry Chemical Fire Extinguisher is **water-tight** . . . it won't become inoperative due to corrosion or caking of dry chemical within the working parts . . . the most inexperienced man in your plant can use the **ANSUL** extinguisher effectively . . . and only **Ansul** has a nozzle to meet all of these requirements!

If your hazards require special long range straight stream nozzles, you can get Ansul Extinguishers equipped with these nozzles at no extra cost. With Ansul Dry Chemical Fire Extinguishing Equipment you have not only the best fire protection but also a choice of models and designs to meet your requirements.

Send for File No. 660. You will receive our latest catalog, a Periodic Inspection Record Chart, "Fundamentals of Fire Extinguishment" and information about Ansul Dry Chemical Piped Systems for automatic protection.

**"PLUS-FIFTY"
DRY CHEMICAL
IS MORE DEPENDABLE
ALL-WAYS!**



THIS TRADE MARK ASSURES YOU OF QUALITY PRODUCTS



(Continued from page 324)

Light Metals Divn. Nigel H. Bell, formerly vice president in charge of sales, Sterling Windows, Inc., New York City, has been named Director of the Light Metals Divn., NPA.

Leather Division. Julius G. Schmitzer, who has been with the Department of Commerce as a specialist in leather, has been appointed Director of the NPA Leather Division.

Machinery Divn. Marshall M. Smith, formerly president of the E. W. Bliss Co., Brooklyn, N. Y., has been appointed Director of NPA's Machinery Division. Herbert L. Tigges, Baker Bros., Inc., Toledo, is appointed NPA Adviser and Consultant on metal working machinery problems, and P. L. Houser, International Harvester Co., Chicago, is named acting chief of the Machine Tool Section.

Iron & Steel Divn. Melvin W. Cole of the Bethlehem Steel Company, is named Deputy Director of NPA's Iron and Steel Divn., to assist David B. Carson, Director of the division, channeling iron and steel products into the defense program.

Building Materials Divn. John L. Haynes, chief of the construction division, NPA, has been named director of the Authority's Building Materials Division.

Containers and Packaging Divn. Harold J. Carr, vice president of the Owens-Illinois Glass Co., has been named consultant to the Containers and Packaging Divn., handling special problems particularly on glass containers and closures.

Construction Machinery Industry

Industry spokesmen posed problem of keeping the construction machinery industry at full capacity in the months ahead. Only about 5% of the industry's capacity is taken up with defense orders, and chief concern is to get enough steel to keep operating. NPA officials said that no end-use restriction on steel is now in sight, pointing out that construction machinery industry is assured of getting an equitable share of steel, along with other industries, to fill non-defense orders.

Barium Carbonate

Industry representatives to furnish production and other data which will form basis for developing proposed order to assure equitable distribution of rated defense orders and to provide for distribution of remaining supply of barium carbonate among essential and non-essential users.

Abrasives

Industry spokesmen said they are now operating at nearly full capacity, turning out about as much abrasives as during the peak period of World War II. Industry is faced with shortages of raw products and some operating supplies; another problem is that of obtaining sufficient electric power. Representatives recommended tighter inventory controls to prevent hoarding of grinding wheels

(Please turn to page 328)



Toothed Lock Washer: Prevents loss of stem nut due to vibration, thereby holding the handwheel securely.



Newly Designed Handwheel: Air-cooled, finger grip handwheel affords sure grip even with greasy gloves.



Improved Packing: Molded packing of lubricated asbestos reinforced with copper wire. Suitable for practically every service. Valves can be repacked under pressure.



Hexagonal Union Bonnet Connection: Eliminates any chance of distortion or leakage even though valve is repeatedly taken apart and assembled.



New Cylindrical Disc Holder: The design of the top portion of the disc holder keeps the disc accurately guided under all operating conditions.

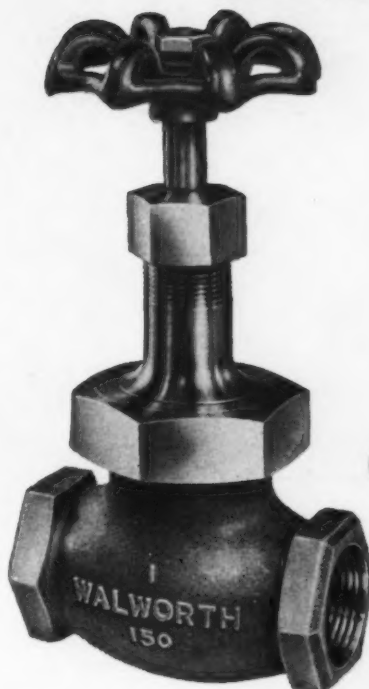


Renewable Asbestos Disc: This disc is suitable for steam up to 500F and is resistant to oil, gasoline, and many chemicals at atmospheric temperatures. Discs for special services are available.



Extra Strong Body: Made of Composition M (ASTM B61) bronze thick enough to provide a high safety factor. Valves undergo hydrostatic shell test of 450 psi.

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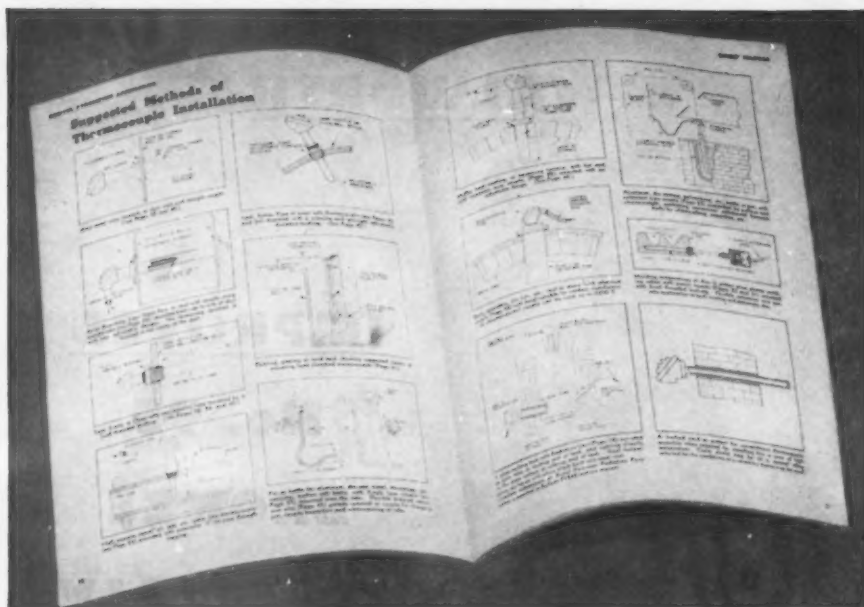
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BRISTOL

AUTOMATIC CONTROLLING, RECORDING
AND TELEMETERING INSTRUMENTS

(Continued from page 326)

and other abrasives. NPA said that if certain critical materials are in such short supply that defense production is hampered, necessary conservation measures will have to be developed.

Fibre Drums

Task group set up to make recommendations regarding possible issuance of end use limitation and control orders at some future time, and for reducing the amounts of steel going into hoops, drum heads and drum bottoms. Big problem at present is getting the paper board and steel required to meet demand for fibre drums.

Foundry Equipment

Spokesmen said industry was at low production level during the first half of 1950, and since the steel suppliers are basing allotments on use during this period the foundry supply industry is particularly hard hit. They also reported shortages of paper bags, metal drums and electric motors. NPA is now studying issuance of maintenance, repair and operation orders to help industry get material for needed repair parts.

Steel Shipping Containers

Steel shipping containers are used primarily by the petroleum, chemical and food industries. Industry spokesmen said container manufacturers had been forced to cut plant operations, and some smaller plants may be forced to shut down unless sufficient steel is made available. NPA pointed out that persons holding defense orders were entitled to material necessary to fill the orders and that NPA would aid in finding steel for such orders.

NPA further said that an end use limitation on steel shipping containers may be necessary to assure that defense and essential civilian needs are met. Task committee was appointed to study problems facing the industry.

Used Steel Drums and Wood Barrels

Principal problems of the industry are (1) difficulty of obtaining used steel drums and wood barrels; and (2) shortage of steel rings and hoops, caustic soda for cleaning, and phenolic resin for coating. Industry recommended return of drums used in exporting, and release by the Government of un-serviceable containers. Task group appointed to make recommendations to NPA.

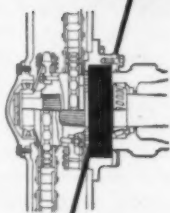
Electric Motors

Industry spokesmen said their chief difficulty is obtaining supplies of copper and aluminum; that industry is unable to get prompt filling of DO orders to obtain copper and aluminum, although bulk of their business is now in defense and defense related orders. NPA officials said they were prepared to take action on an individual company basis where aid is warranted to help fill DO orders and for such defense supporting purposes as providing equipment to expand basic industries. Committee appointed to begin work on drafting a proposed industry

(Please turn to page 330)



This rugged motor grader, made by Caterpillar Tractor Co., Peoria, Illinois, features a tandem-swing drive in its rear wheel design which gives it great traction and grade accommodation.



INSUROK

T-602

stands up where metals fail!

Graphited plastic laminate eliminates sleeve trouble in "Caterpillar" Motor Grader

On their Motor Grader tandem-drive housing pivot bearings, Caterpillar Tractor Co. experienced premature sleeve bearing wear. These bearings are subjected to intermittent oscillating motion and are difficult to lubricate. Field reports showed that metal sleeves became scored after only 300 to 600 hours of operation.

Richardson engineers recognized this as an ideal job for INSUROK, Grade T-602. In such difficult bearing applications, this self-lubricated graphitized phenolic laminate provides just the right combination of properties for long, trouble-free service. Result for "Caterpillar": three years of use—no trouble reports!

In hundreds of similar applications, laminated and molded INSUROK made by The Richardson Company are solving difficult problems for industry. Investigate these materials, today.

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(Continued from page 328)

wide program. Two task groups set up to make specific recommendations for conservation of scarce materials through standardization, simplification of design and changes in specifications.

Automobiles

NPA Administrator Wm. H. Harrison told industry members that military requirements for steel, copper, zinc and other important materials will be higher during the second quarter of this year. Group is to provide NPA with estimates of steel requirements based on current production schedules. They said that until more defense orders are placed with the industry they believe it essential that the production and labor force be maintained at the highest level commensurate with available supply of materials.

NPA officials pointed out that although plans are now underway for expanding the machine tool industry, increasingly heavy defense requirements will permit only limited machine tool production for non-defense needs and that the automobile industry should plan accordingly.

Ferromanganese

Members of the Ferromanganese industry advisory committee were told that manganese supplies are barely adequate to meet steel demands of both defense and civilian production. Steel for defense consumes a higher than normal percentage of manganese.

Benzene

Large users of benzene estimated that supplies for civilian uses will grow somewhat tighter during 1951, ease and perhaps equal present supply in 1952, and rise above the present level in 1953 if the mobilization program follows the expected pattern and if production goals are met. A large part of the benzene supply has been diverted from normal uses to the production of synthetic rubber.

The Government was asked to authorize facilities for the production of 88 million gallons a year of synthetic benzene from petroleum, to meet needs of the defense program. Representatives of the Defense Solid Fuels Administration reported that a survey is now under way to determine possibilities of recovering benzene from coke ovens.

Bolts, Nuts, Rivets

Members of the Bolts, Nuts and Rivets IAC said they cannot obtain sufficient quantities of steel for the manufacture of their products; though most of their normal needs are for low carbon steels, defense program is resulting in increased demands for high carbon quality steels of which they are unable to obtain sufficient quantities.

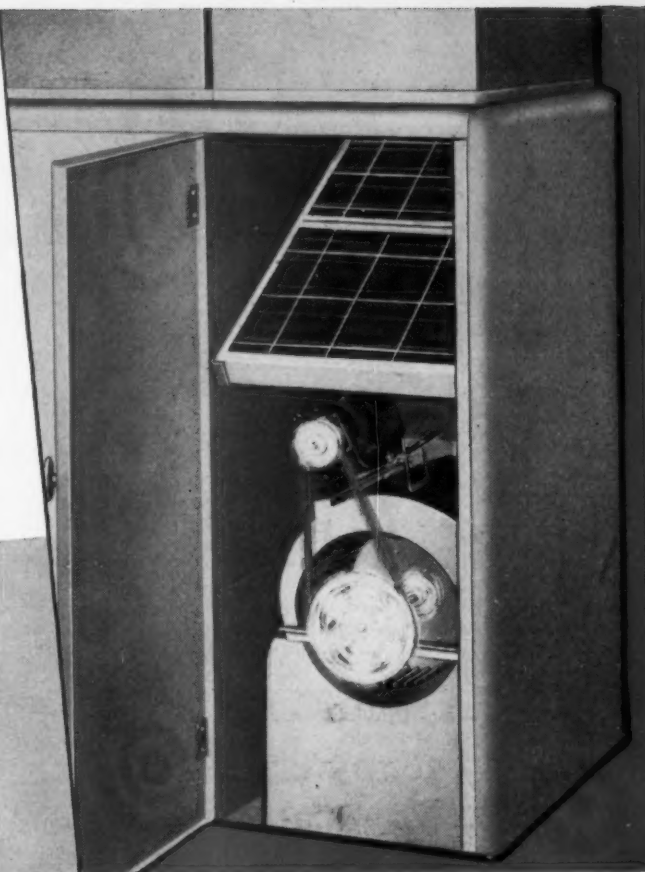
NPA informed the committee that it is developing a steel allocation plan for fasteners, including nuts, bolts, rivets and welding wire needed in the freight car program, and that it would consider the inclusion of the industry's need in allocating steel for any future supporting program. Also, that assistance will be

(Please turn to page 332)

End Motor Failures Due to **DUST**

Get the Facts on EMERSON-ELECTRIC'S New Dustproof Centrifugal Starting Switch

PATENT APPLIED FOR



The furnace blower is but one of many motorized applications where dust or other solid particles, in the atmosphere, create an operational hazard to motor life.

Your blowers, appliances or power tools will have a competitive advantage, with this new feature.

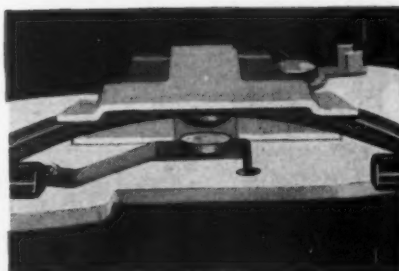
This is important *news* for every user of general-purpose split-phase or capacitor-start ventilated motors! Emerson-Electric's uniquely shielded starting switch was originally designed for power saws—which operate under the most difficult conditions. In addition to the excellent results reported on saw motors in daily service, tests have been conducted even to the extreme of pouring saw dust into the ventilated openings, while the motor is operating, without hindering the switch action.

This improved switch involves no change in external motor dimensions, internal design (other than parts shown), or motor performance . . . it is readily adaptable to any Emerson-Electric general-purpose motor employing a cutout switch. It will eliminate motor failures caused by dust, dirt or lint on switch contact points.

For complete information, write for Motor Data Bulletin No. 119.

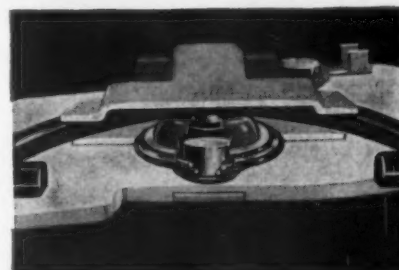
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Before:

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- RUBBER SHOES—long-life, replaceable
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AND PRICES

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(Continued from page 330)

given where possible to manufacturers in production for defense and highly essential civilian needs.

Rubber

Consensus of Rubber Industry AC meeting was that Government owned rubber plants will meet production schedules in March and continue to rise thereafter at a steady rate. NPA officials, contemplating rubber allocation order for March, said it is likely that an increase will be required in the production of camelback for tire recapping. It was indicated that latex may be allocated separately from dry natural rubber beginning in March and that its consumption may be reduced somewhat below the present rate of about 6,000 tons a month.

DDT

Current supplies of commercial grade DDT are tight, primarily because of shortages of basic chemicals. Supplies of benzene—a principle ingredient—are low now, NPA said, but are expected to increase some 50% by mid-1952. A tight supply situation also exists in regard to chlorine and sulphuric acid, two other essential DDT chemicals. NPA said that problem of individual supply bottlenecks would be studied and assistance given wherever possible to those manufacturers handling defense work.

Cotton Duck

Industry representatives proposed that NPA require all looms producing duck continue to be used for that purpose. Some carpet mills are already converting to duck production, and additional cotton mills can convert to duck production to increase the supply it was pointed out. Other heavy cloth such as twill and drill can be substituted for duck in some end uses to make duck available for essential uses, industry spokesmen said. NPA officials said that if it is necessary to increase duck production, action would be taken to make additional yarn available.

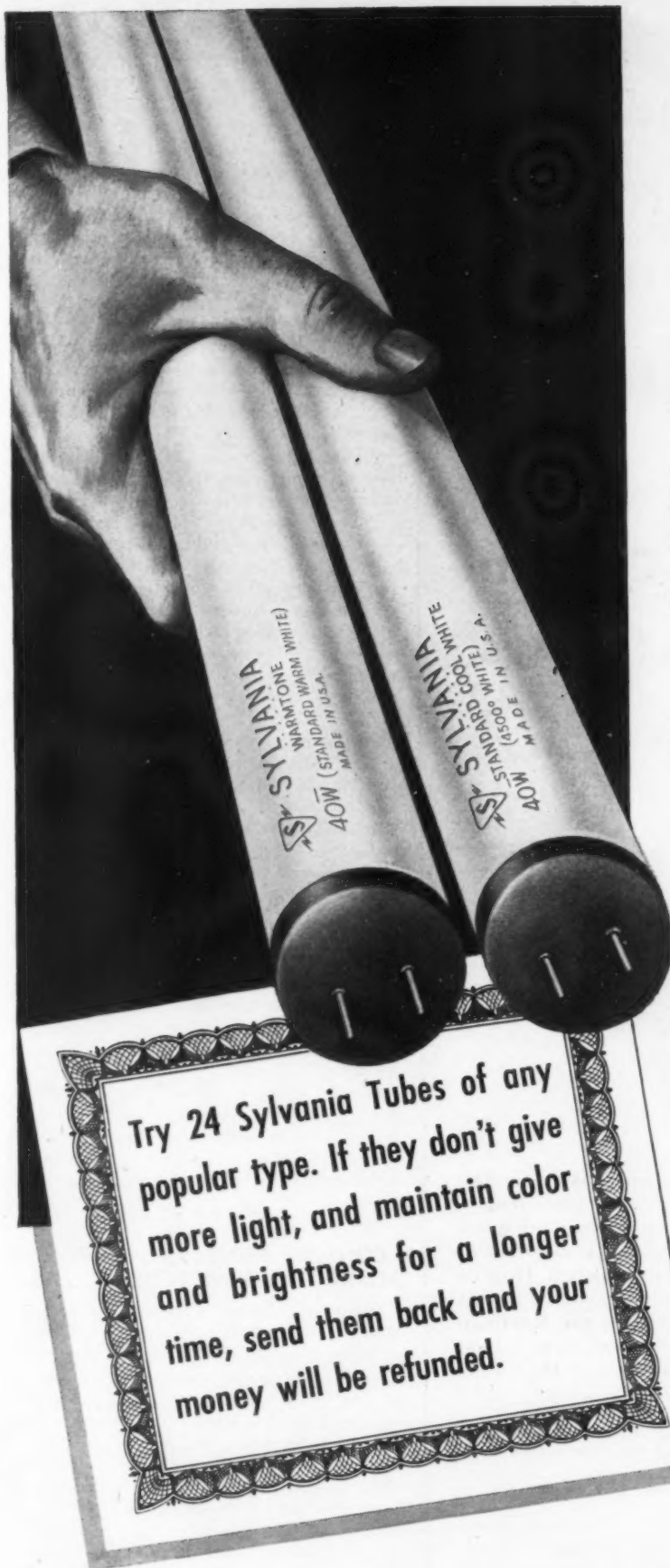
Builders Hardware

Order to provide for simplification of hardware design and to conserve critical materials for defense production is under consideration. NPA said such an order would be similar to a World War II hardware simplification order with adjustments made for recent changes in production practice.

Zinc

Spokesmen for Zinc Producers and Zinc Users groups said that part of the present maldistribution results from heavy inventory demands, as users attempt to build up stocks to the 45 day supply permitted under the order (M-15). They believe that this inventory demand will slacken in a few weeks, and recommended that no changes be made in the present order now. Spokesmen for the zinc producers said there was some evidence of abuse of "DO-rated" orders; that some manufacturers had placed large

(Please turn to page 334)



Try 24 Sylvania Tubes of any popular type. If they don't give more light, and maintain color and brightness for a longer time, send them back and your money will be refunded.

Insist on SYLVANIA tubes and get “FLUORESCENT AT ITS FINEST!”

Here's the most challenging lighting offer ever made! The burden of proof is entirely on us. Either Sylvania Fluorescent Tubes give outstanding over-all performance or you get your money back. What could be fairer than that?

What is “outstanding over-all performance?”

Outstanding over-all performance means you must be satisfied with Sylvania tubes 4 ways.

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Call your Sylvania supplier today. Order 24 Sylvania Fluorescent Tubes of any popular type . . . ask for your “certificate of assurance.” If these Sylvania Tubes are not the best you ever used . . . in all respects . . . send them back to the supplier and your money will be refunded.

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Unusually dependable
for strength, accurate fit,
clean-running threads—

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Top Quality

**High Carbon
Cap Screws**



● The most all-around satisfactory fastener you can use, with maximum strength, excellent *working* qualities and good appearance. Size and shape are held to remarkably close tolerances. Double heat treating adds the final value to this fine product produced by the Kaufman Double Extrusion Process. It pays you to specify and buy Cleveland High Carbon Heat Treated Cap Screws.

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**KAUFMAN DOUBLE
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Specialists for more than 30 years in
CAP SCREWS, SET SCREWS, MILLED STUDS
Ask your jobber for Cleveland Fasteners

(Continued from page 332)

"DO-rated" orders for zinc, although they could not use it in fabrication for several months. They suggested that zinc fabricators be required to use present supplies before placing additional rated orders. NPA officials said it may become necessary to amend M-15 to prohibit the less essential uses of zinc.

NPA told representatives of the durable goods industry that there will be less steel, copper, aluminum and other scarce materials available for non-defense production in the second quarter than there was in the first. Told representatives of the metal furniture and equipment industry that it will become necessary to distribute materials on the basis of essentiality.

Controls on the use of plywood in less essential end products may be necessary in near future.

Members of Screw Manufacturers Industry said they could not obtain sufficient MRO Materials; also that shortage of Molybdenum alloy steels has retarded certain screw production. NPA said it is now developing MRO program.

Boring machine industry representatives said that they are now booked far ahead for some types of boring machines, and are having trouble getting castings, particularly of the machine tool grade.

Steel. Members of the Cast Iron Boiler and Radiator Industry AC were advised by NPA that some of the factors contributing to the backlog of iron and steel orders were: (1) defense needs for plate are so great that some sheet rolling mills have been converted to plate rolling; (2) programs for defense-supporting industries are taking some of the available supply; (3) inability of present coke facilities to expand is curtailing some blast furnace operations, and (4) the shifting to steel by many manufacturers as a substitute for other critical materials.

Glass Containers: Glass Container AC advised that need for glass containers is taxing present productive capacity, and that the shortage of papers for cartons is beginning to be felt by the industry.

1 1 1

**CONTOUR PROJECTOR WEAPON
AGAINST HIGH INSPECTION COSTS**

What the Kodak Contour Projector Model 2 is, and how it can be used to magnify dimensions, shapes and surfaces in production or tool making, is the subject of descriptive booklet being offered by the Eastman Kodak Co., Industrial Optical Sales Divn., Rochester 4, N. Y. Pointing out that the projector is a potent weapon against rising inspection costs, the booklet describes both the features and application of the machine. Some of the special jobs that the projector can do as a matter of routine include, as shown in the booklet, looking into deep recesses, exploring and measuring sizable concavities in one continuous operation at high magnification, and checking intricate dimensional relationships. The projector also simplifies the staging of parts.

39% LESS REJECTS now that they're made from *Carpenter* Stainless Tubing



When they first made collapsible handles for uranium detectors, inspectors rejected 40% of the finished units because of inaccurate slip-fits between sections. Costs went haywire and needed equipment could not be delivered on time.

Now handles, with perfect slip-fits between sections, are made from Type 304 Carpenter Stainless Tubing, at a reject rate of only 1%. Exceptional wall uniformity in various tube sizes makes possible mass production of a previously "fussy" job.

To find ways to conserve material needed for today's defense program, and to get best possible fabricating results, make use of Carpenter's experience with Stainless Tubing. We will be glad to work for you and provide useful printed information.



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Export Department: Reading, Penna. "CARSTEELCO"

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STAINLESS TUBING



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Want Additional Product Information? See Page 19.

335



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Guard Technical Information

(Continued from page 74)

have regular contacts in the Government from using their usual channels when questions of security and the public interest arise. The OTS service, rather, makes it possible for persons who do not have direct contacts to obtain expert guidance from the Government on matters involving strategic technical information.

It is not contemplated that persons in a position to release unclassified technical information will normally call on OTS for guidance regarding release to known representatives of recognized scientific and technical journals, radio networks, press associations, and newspapers. Most of these organizations have wide experience in safeguarding such material. However, the service is available to both the editor and the source of the material if they desire to use it.

Export of Technical Data

The program of voluntary protection centering in OTS is concerned with information for release within the United States, which amounts to publication to the world. A separate service for the guidance of persons transmitting unclassified technical information directly to other countries is provided by the Office of International Trade, Department of Commerce.

A special unit of/OIT clears inquiries on the security implications of exporting unclassified technical data on advanced developments, technology, and "know-how"; on prototypes of such developments; on special installations; and on arms, ammunitions, and instruments of war which do not have security classifications.

1 1 1

STRIP METAL WEIGHT AND LENGTH CALCULATOR

Described as a precision instrument, calculator available from the Precision Steel Warehouse, Inc., 4409 West Kinzie St., Chicago 34, Ill., is designed to compute "at a glance", the weight and length of strip metals in coils or straight lengths. Although designed so that basic calculations are for cold rolled strip steel, a factor table is included which enables the user to find his answer for aluminum, brass, copper, magnesium, monel, zinc, and many other metals. It is said to save hours of time in comparison with the use of conventional computing methods. The calculator is available to purchasing agents, estimators and others without cost.

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MILLS: Complete Rolling Mill Installations and Auxiliary Equipment.

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Plants at: E. Chicago, Ind. • Wheeling, W. Va. • Pittsburgh, Pa.

The American System Is Worth Fighting For

(Continued from page 100)

interest of the reader, but he indicates the important regional differences in resources and the historical processes which have made some cultures rich, others poor, in opportunities.

In all the contexts of "comprehensive planning" in this book, Professor Wright makes his definition clear. He calls it:

" . . . the type of system, admittedly advocated at present in which the general over-all pattern of development is planned and licensed in advance, by a unified group of 'experts'—whether businessmen, bureau chiefs or commissars".

Leadership and Progress

There is an important significance to the layman in the first five chapters of this book. In them the author discusses in detail the fundamental values he believes an economic system should serve, and which he believes can be effectively achieved only by the profit or capitalist system.

The author points up the lamentable absence of any apparent and

present relation between economics and ethics in much of our present thinking. He appeals to leadership and education to discover the basic values of both and to spread a universal awareness of them. He emphasizes the fact that leadership functions best through persuasion, and is therefore not to be confused with the power of office or position.

He confidently looks for such leadership to professional, business, religious, and intellectual groups; but he recognizes the differences that may exist in their interests, their philosophy, their value-sentiments or their common agreement on social policy.

The threat of the atomic bomb may prove a powerful influence in diminishing the vast amount of energy which moral, political and economic leaders habitually expend in combatting one another.

Professor Wright's conception of progress is illuminating and highly invigorating. Capitalism, he maintains, through the freedom it accords science, research, invention and initiative is the system most favorable to man's material progress; but real progress means "social betterment" as well, and it involves moral and esthetic values.

The aim of progress in general is not a static ideal; it is "continual development", an "ideal process of variation".

Not mere satisfactions, but "better wants" is the message the author conveys.

There is an abundance of reasoned logic in his fears of comprehensive planning to make us extremely cautious of any extended experiment in it. The defects of our capitalist system are not glossed over or subtly explained away as temporary or transient ills. Immediate, determined, and energetic treatment is required. Knowing the nature and cause of the illness, Americans individually and collectively can apply the remedy.

What Can Be Done in Such Crises

The crises in our capitalist system are as much ideological as economic. Professor Wright's discussions of what can be done in such crises and in such matters as industrial monopolies, international trade, research, income taxation, mass education and labor unions are perhaps the most penetrating and stimulating in our time. They will prove highly profitable to the professional economist and lay reader alike.

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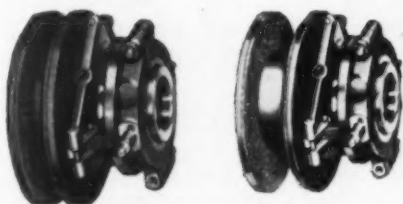
MORSE-ROCKFORD

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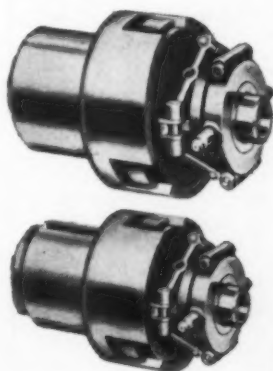
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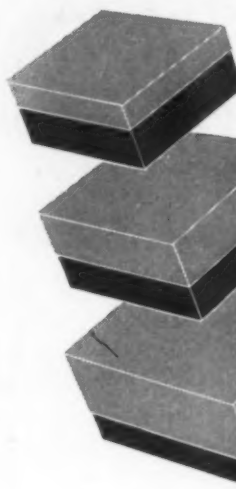
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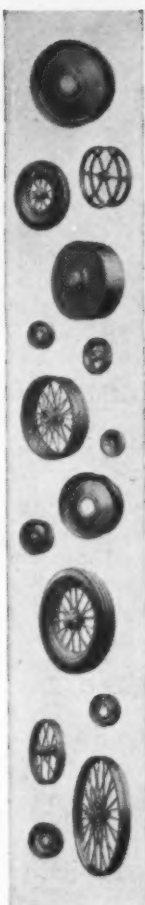
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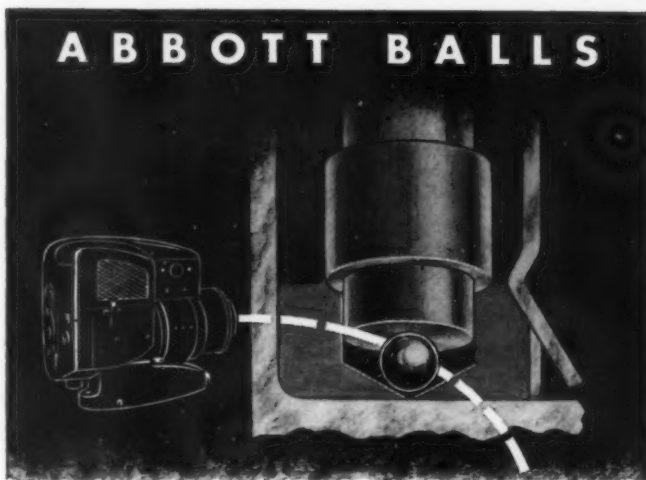
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LETTERS . . .

QUALITY CONTROL

I would appreciate your sending me information concerning the phase of quality control and quantity control of materials as related to manufacturing plant management.

Emanuel Laster,
Brooklyn, N. Y.

● See page 82 of the July, 1950 issue of **PURCHASING**. Also communicate with Simon Collier, Executive Secretary, American Society for Quality Control, 22 East 40th Street, New York, c/o Johns-Manville Corporation. A new book on the subject, "Quality Control and Statistical Methods," by M. Schrock, is published by Reinhold Publishing Co., 330 W. 42nd St., New York.—Ed.

DATED HUMOR

Some engineers look upon purchasing as a necessary evil and agree with Elbert Hubbard, who described the typical purchasing agent as—"a man past middle life, spare, wrinkled, intelligent, cold, passive, non-committal, with eyes like a cod-fish, polite in contact, but at the same time unresponsive, cool, calm, and damnably composed as a concrete post or a plaster of Paris cat; a human petrification with a heart of feldspar and without charm or the friendly germ, minus passions, or a sense of humor. Happily they never reproduce, and all of them finally go to Hell."

George P. Crawford, Jr.
Combustion Engineering
Superheater, Inc.
Chattanooga, Tenn.

● The brilliant Elbert Hubbard called the turn in the concluding sentence of his classic definition. His "typical purchasing agent" (circa 1910), without power of reproduction, is obsolete today, save for a handful of superannuated and decidedly untypical museum specimens, awaiting their turn for the ferry across the Styx. For a current and official definition of the purchasing agent, see the *Handbook of Descriptions of Specialized Fields in Management and Administration*, compiled in 1945 by War Manpower Administration, from which we quote:

"Qualifications: Executive ability; knowledge of economics, sources of supply, materials, and buying procedure, general production requirements, business conditions, present-day governmental

control of industrial purchases, office procedure, and commercial law . . . must have ability to maintain a cooperative relationship with vendors, to deal with the public in a courteous and pleasing manner . . . tactful, honest, resourceful, of good intelligence, and possess a keen purchasing and business judgment, skill and discrimination."—Ed.

RECORD FILES

We are desirous of obtaining information regarding filing systems for making long lists of physicians' names. That is, a list which may be used as a master list, and from which quick subdivisions may be obtained.

Kenneth Champion, Purchasing Agent
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INDUSTRIAL LOGISTICS

In one of your past editions, I ran across an article which indicated your company had available a booklet for information on Industrial Logistics. Will you please provide this office with one copy of the information you have on this subject.

E. T. Kennedy, Purchasing Agent
Purchasing and Contracting Office
Westover Air Force Base, Mass.

● This inquiry probably refers to the Purchasing Opinion survey on "How Can Distribution Costs Be

Reduced", which appeared in our April 1950 issue and was the basis of a further discussion on "Reducing Costs of Distribution" in the October 1950 issue, page 89.—Ed.

ELECTRONIC STENCIL CUTTER

On page 174 of your November issue, there is an article and illustration of the Stenaflex Electronic stencil cutting machine.

As we are interested in obtaining any data and information on this machine we would be pleased if you would forward same to us along with prices of the machine and accessories. You might also advise if there is a Canadian representative for this instrument.

A. K. MacArthur, Ass't Mgr. Pur. Dept.
Imperial Tobacco Co. of Canada, Ltd.
Montreal, Canada

● Times Facsimile Corporation, 229 W. 43rd Street, New York, N. Y. is the manufacturer.—Ed.

SUPPLIERS' DAY

Just a note to tell you how pleased we were with the splendid story about the "Metuchen Suppliers' Day". (January 1951 issue, page 72.) Our sincere thanks and compliments on a story very well done.

John E. Sattler,
Public Relations Mgr.,
Ford Motor Company
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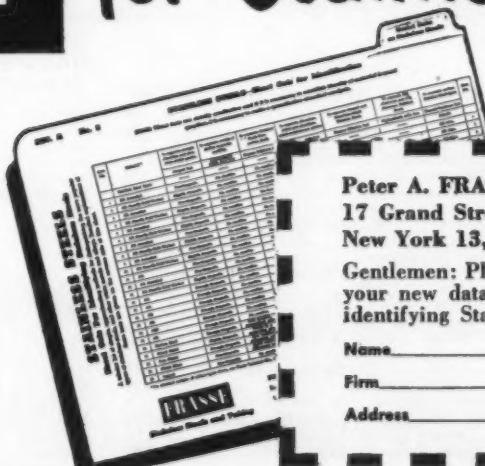
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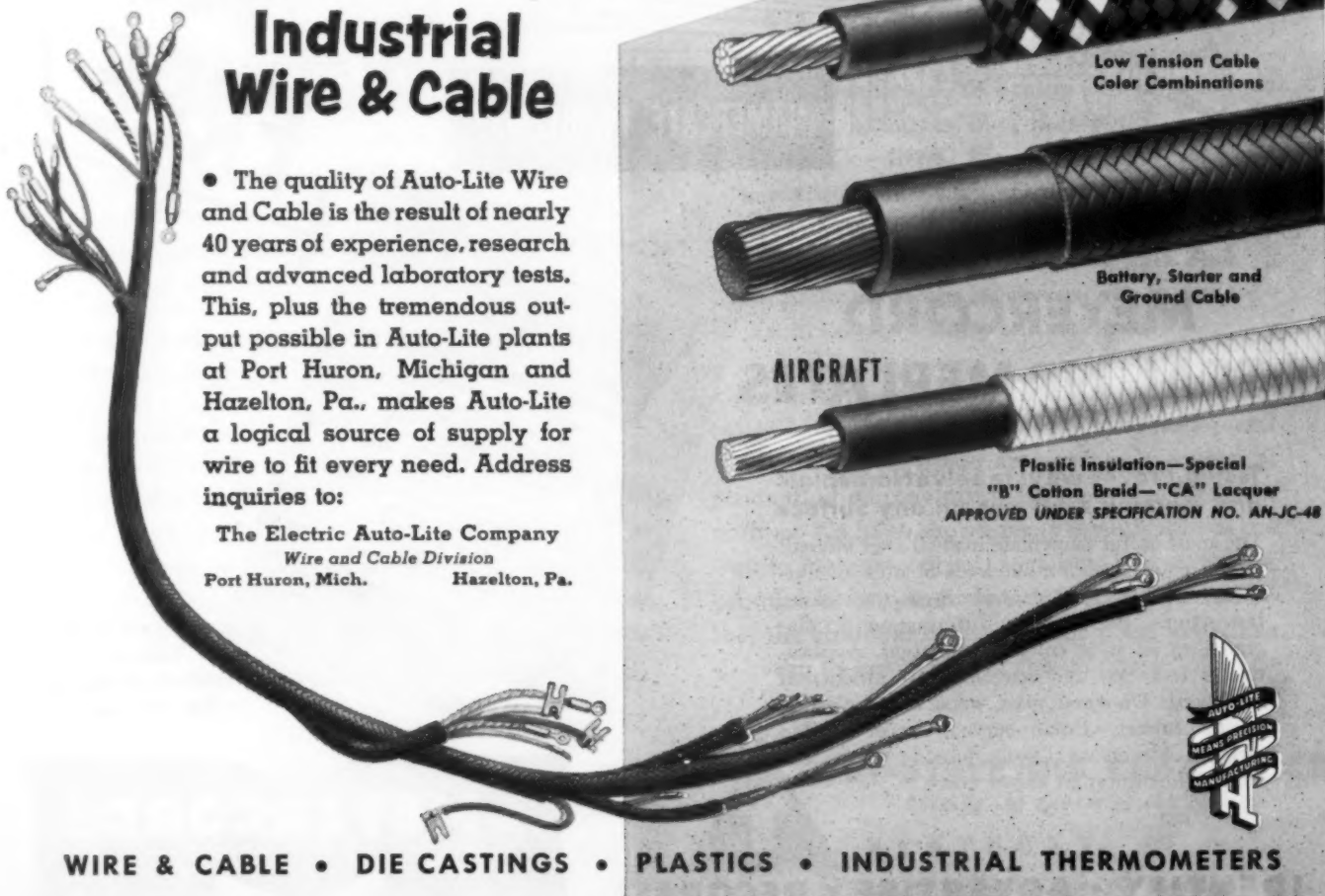
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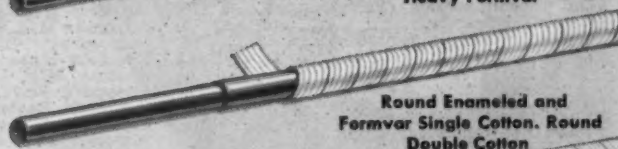


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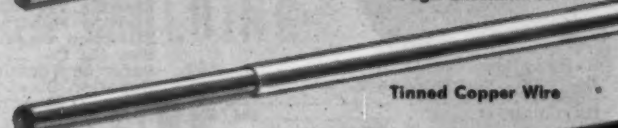
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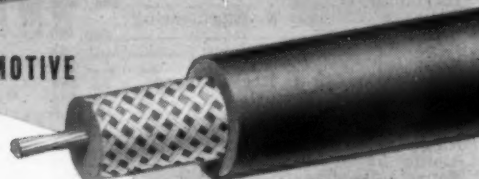


Round, Rectangular and Square Vega Chromoxide

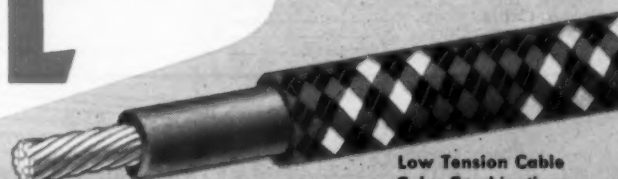


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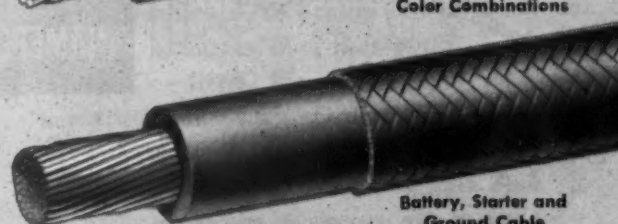
AUTOMOTIVE



Ignition Cable Neoprene Sheathed

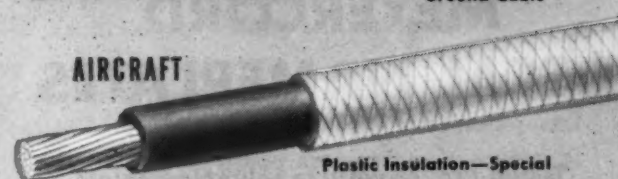


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Caster Quiz

A "quick facts" feature with helpful suggestions on the use of casters... to reduce materials-handling costs, the "Reducible 30%"*

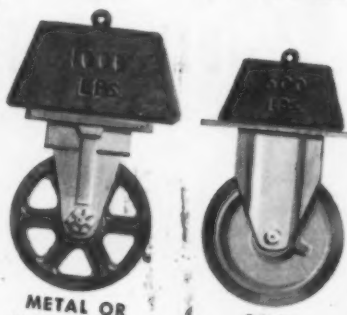
Q. How can light, portable equipment roll easier on rough floors or over obstacles?

A. On the amazing new Bassick "Flying Saucer" Caster. Its saucer-like 3" wheel, set at a 45° angle, rides over rough spots and obstacles equal to an ordinary wheel twice the size... with the extra asset of low overall height that cuts tipping danger. Low-cost. Ideal for shirt racks (below), shoe racks, garage equipment, etc.



Q. Should metal and rubber-tread wheels of equal size carry equal loads?

A. No. Figure that soft rubber-tread wheels should carry about 50% of the load carried by metal or hard-tread composition wheels of equal size.

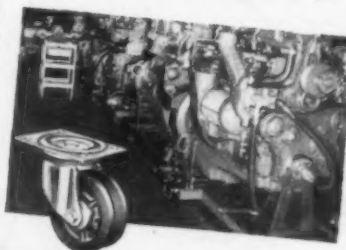


METAL OR
HARD-TREAD

SOFT
RUBBER-TREAD

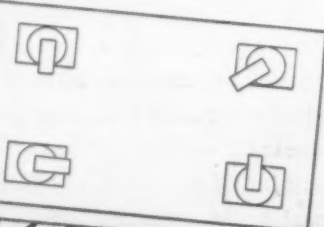
Q. Is there a simple way to set up a controlled-movement, easy-rolling assembly line?

A. Use Bassick Grooved-iron track, as Cummins Engine Company, Inc., successfully does in assembling its diesel engines. This low-cost scheme gives controlled flow, easy movement, great flexibility. Track is easily installed, self-cleaning.



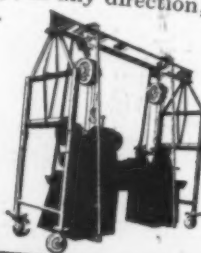
Q. When should only swivel casters be used on trucks?

A. For limited or confined areas where equipment must frequently move sideways to machines, bins, etc. This arrangement is not advised for long, straight travel, where a combination of swivel and rigid casters should be used for steering control.



Q. What's an easy way to raise and move heavy equipment?

A. A portable A-frame, on Bassick Casters, supports hoists, and can be moved throughout the plant to carry engines, heavy machine parts, etc. Bassick Heavy-Duty Casters (sizes for loads up to 10,000 lbs. or more per caster) add flexibility, in any direction, at any time.



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* According to cost analysts, materials-handling (about 30% of total cost) affords about the only real opportunities for cost reduction today.

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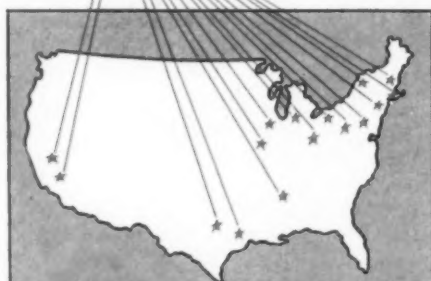
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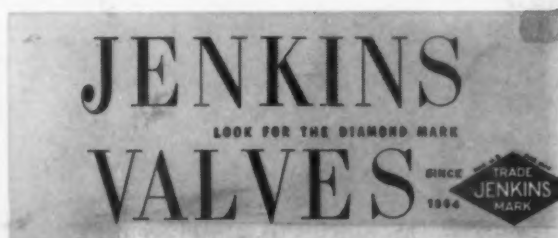
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